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DUPLICATE
G. C.

Surgical board.

# CATCHING'S COMPENDIUM

—OF—

# PRACTICAL DENTISTRY

# FOR 1893.

B. H. CATCHING, D.D.S.,
EDITOR AND PUBLISHER,
ATLANTA, GA.

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# THE COMPENDIUM FOR 1894.

The COMPENDIUM has passed the experimental stage and is now a reality, and a necessity for every active progressive dentist, to enable him to keep fully abreast with the dental profession.

In this issue, the condensed practical results of the dental journals of six different nations are given.

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The proposed cosmopolitan character of the work is begun in this issue, by the assistance of able editors and translators of the German, French and Italian.

W. D. Miller, M. D., D. D. S., of Berlin, editor and translator of the German.

A. C. Hugenschmidt, M. D., D. D. S., Paris, editor and translator of the French.

Wm. Dunn, D. D. S., Florence, editor and translator of the Italian.

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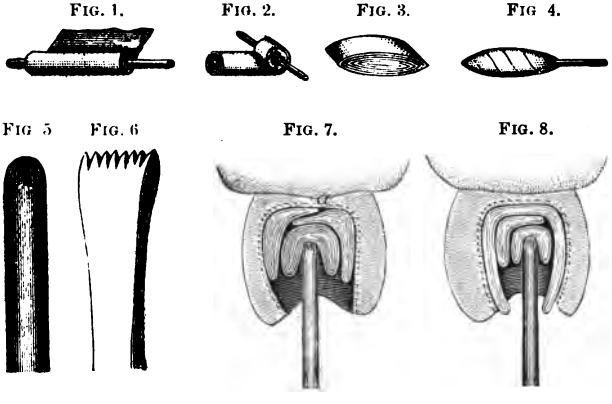
# OPERATIVE DENTISTRY.

## CYLINDER FILLING.

DR. J. H. BEEBEE.

Dental Cosmos, December.

I will first describe the mode of making the cylinder. A piece of foil—one-half or one-third or even a whole sheet—is placed upon a pad of some elastic material, and a wire of a certain size is placed on its edge, and with the fingers the gold is rolled upon and around the wire (see Fig. 1). The size of this wire governs the length of the cylinder, which should be somewhat greater




than the depth of the cavity, so that the gold, before final condensation, will protrude above the margin of the wall. The wire being withdrawn, the roll thus produced is wound upon the point, or if a particularly soft cylinder is desired, upon the body, of a square or five-sided watchmaker's broach (Fig. 2). When this roll is large enough, the unwound gold is torn away from that which is on the broach, and that which is on the broach, which is the cylinder, is removed, and with gentle pressure slightly flattened between the thumb and finger (Fig. 3). Various lengths and sizes, according to the cavity to be filled, are made, and the gold is ready for use.

In preparing the cavity there is absolutely no necessity of a

retaining pit; a slight groove, shown by the dotted line in Figs. 7 and 8, is all that is needed, and in crown cavities in which the grinding-surface alone is involved, even this precaution is not necessary if the walls are parallel. The form of point to be used is shown in Figs. 5 and 6. The former is round, while the latter is flat and wedge-shaped. These are the characteristic forms, but of course there will be various sizes and crooks to enable the operator to use them in differently located cavities. I will illustrate the process of cylinder filling by the drawings Figs. 7 and 8. These represent a bicuspid in which decay has removed a large portion of the approximal and also a portion of the grinding surfaces.

The first cylinder—a large one—is placed in the cavity and pressed to one side, a portion of it lying against the cervical wall. Another cylinder is put in and crowded to the other side, a portion of this being allowed to cover the remainder of the cervical wall and also to overlap the first cylinder. A third cylinder is now placed in the center, and with a large wedge-shaped instrument is driven home. Then another cylinder is placed as at first, at one side, and another on the other side, with a third again in the middle and crowded home as before. Thus the operation is continued till near the grinding-surface, when we begin to anneal the gold and to alternate the cylinders from the horizontal to a perpendicular position.

Annealed cylinders, however, should not be used till all of the walls are protected with soft foil. After there is no more space to be filled, a large corrugated point is placed upon the filling, and with a reciprocating screw motion and considerable pressure the surface is all gone over and condensed thoroughly. Then a smaller similar point is to be used, and then the burnisher. After a thorough burnishing the file, and again the burnisher, and where practicable a small ball burnisher, and lastly the finish. Let me add right here that there is no more necessary instrument than the burnisher, and on it depends the success of nearly every cylinder filling. The mode of filling a simple cavity is the same, except that nearly the whole of the operation is done by the instrument shown in Fig. 5. If there are fissures running out from the main cavity they should be filled first. Then the large cylinders should be placed on either side and pressed outward; then one at each end,

and the instrument, Fig. 5, forced into the center, thus creating a secondary but smaller cavity. As the operation progresses smaller and smaller cylinders of necessity are used, until finally one tightly rolled is driven into the last opening left by the wedging instrument. The whole is to be finished as before. Where possible, I find that the lobed engine-burnishers are most useful, but unfortunately none of our manufacturers make them in correct form. If a soft spot is found a wedge-shaped instrument is pushed in, and the space thus made is to be filled with a small cylinder. This last is, however, rarely necessary when the operator has become expert.

A novice in this mode of operation, and one who has used gold in its cohesive form exclusively, will find one large bugbear. It has been his habit, when starting a filling, to fasten the first piece, and if after he has commenced a filling he finds that the gold is loose, he will, if a conscientious operator, remove whatever metal he has placed in the cavity and begin again. The cylinder operator would simply drive a wedge-shaped instrument into the gold, and in the opening thus created drive another cylinder, and if this is not sufficient he would do the same thing over again until he has the gold fastened.

Objection to this method has been urged by some of the wiseacres, that there may be—nay, is—left a triangular space at the point where the cervical wall and the two cylinders meet (Fig. 7, *a*).

In all of this form of work hand pressure alone is advocated, and will, I believe, do the work better, safer and easier for both patient and operator than any other mode. There are some variations from the above description that may be of interest.

In Fig. 8 is shown a mat of gold lining the entire wall of the cavity, with cylinders in place, crowding it to the wall. Our triangular friends will here find a relief. Another way, and a very good one where a small cavity occurs in a position that renders a good view difficult, is to fill by means of a telescopic cylinder (shown in Fig. 4).

This form of cylinder is a little different from those already described, in that in rolling the gold upon the point of the broach it is done spirally, and when of sufficient size is revolved between the thumb and finger till tight and perfectly smooth.

It is then removed from the broach, and the open end—the end farthest from the point—placed in the cavity and forced in by

a pair of pliers grasping its apex. The remainder of the operation is then to be finished as in the process already described. The action in this case is that of a roll of paper, the center of which has been drawn longitudinally from the coil and pushed back to its original position.

There are a few other modes of preparing the gold that I have not mentioned. The principle of the work is not different, however. If it is desired to use an even flat cylinder, a flat, thin screw-driver-like instrument, instead of the five-sided broach, may be used. Instead of rolling the gold upon the wire, it may be folded by means of a long, slim knife, the edge of which is to be placed longitudinally through the center of the sheet as it lies upon the elastic pad. Gentle pressure will crease the gold so that it can be folded upon itself, and several repetitions will fold the gold into a long, narrow strip, which can then be rolled upon the broach.

The beginner in the use of cylinders must not be discouraged if he fails in several attempts. He will find the first pieces of gold dropping out of the cavity, and the portion that is used cohesively will fall out, owing to the fact that he condensed the surface too thoroughly as he proceeded. He will find, when he comes to finish, that his cylinders are not long enough, and, though the filling may have no soft spots in it, there will not be metal enough to finish the filling. Experience alone will remedy these difficulties, and when the operator has thoroughly mastered this mode, he will wonder how he ever practiced dentistry before, and many a gold filling will be seen in his patients' mouths that otherwise would be of cheaper material.

## TIN-TACK CUSPS FOR AMALGAM FILLINGS.

DR. A. A. BURNS, SMITH'S FALLS, CAN.

Dominion Dental Journal, July.

In inserting a large amalgam crown filling it is often found very hard to replace the cusps of the grinding surface. This may be accomplished by the use of the small round-head tin-tack, commonly called gimp tack. After the filling has been well retained, and cavity about half filled, a small hole may be made and one of these tin-tacks inserted at point where cusp is desired to be made.

The amalgam can be packed around the tack, and it will be found to readily adhere to it on account of the affinity of mercury for tin. In a very large filling a couple of cusps may be had in a similar way. The great advantage in this way of cusp building is in the perfect articulation. The amalgam may be mixed a little soft, as the tin-tack will readily absorb the surplus mercury. After filling is in place, the patient is requested to close the teeth and the cusps will be found to conform perfectly with the occluding tooth. It is better to always have filling a little full, in this case, so that the pressure will give the above result. This makes one of the prettiest plastic fillings inserted, and experience has proven their durability.

## GOLD FILLING, TO REPAIR WITH AMALGAM.

DR. H. BARNES, CLEVELAND, OHIO.

Ohio Dental Journal, February.

Take a little scrap of amalgam already mixed and which has crystallized, then heat a spatula quite hot and press the amalgam into place; as it immediately becomes hard no danger is feared for immediate dislodgment. This is especially used in those cases when it would loosen the gold filling if much cutting were done.

## COMBINATION FILLING MATERIALS.

DR. BENJAMIN LORD, NEW YORK.

International Dental Journal, August.

A combination in which I find great interest is in the use of soft or non-cohesive gold with tin foil. This is no novelty in practice; but I think that, for the most part, too great a proportion of tin has been used, and hence has arisen the objection that the tin dissolved in some mouths. I am satisfied that I myself, until recently, employed more tin than was well. I now use from one-tenth to one-twelfth as much tin as gold, and no disintegration or dissolving away of the tin ever occurs. I fold the two metals together, in the usual way of folding gold to form strips, the tin being placed inside the gold. The addition of the tin makes the gold

tougher, so that it works more like tin foil. The packing can be done with more ease and certainty; the filling, with the same effort, will be harder; and the edges or margins are stronger and more perfect.

The two metals should be thoroughly incorporated by manipulation. Then, after a time, there will be more or less of an amalgamation. By using about a sixteenth of tin, the color of the gold is so neutralized that the filling is far less conspicuous than when it is all gold; and I very often use such a proportion of tin in cavities on the labial surfaces of the front teeth.

If too much tin is employed in such cases, there will be some discoloration of the surface of the fillings; but in the proportion that I have named, no discoloration occurs, and the surface of the filling will be an improvement on gold in color.

By the width of the strip of tin and the width of the strip of gold. I get the proportions in that way, then lay the tin on the gold and fold the gold over and over, which keeps the tin inside the gold.

There is another combination in which I find great interest and advantage. It is the using of non-cohesive and cohesive gold, by folding the two together in the proportion of one-third cohesive to two-thirds non-cohesive. I first fold the non-cohesive once, then lay it on the strip of cohesive gold, and fold the two together; the folding thus secures the cohesive always on the outside.

Gold prepared in this way should be used as soft gold, and works almost exactly like soft or non-cohesive gold in those qualities in which soft gold is superior to cohesive; but it is tougher, packs more readily, makes a more solid filling, and gives stronger and better margins.

## COHESIVE AND NON-COHESIVE GOLD IN FILLING.

DR. C. N. JOHNSON, CHICAGO.

Dental Review, August.

Let us suppose a cavity properly prepared on the proximate surface of a bicuspid, extending well over on the occlusal surface.

The proper preparation of a cavity like this implies that the cervical outline shall be as nearly horizontal as circumstances will permit. An abrupt angle between the cervical and lateral outlines is of course impracticable, but the curve should be a rather sharp one, in order to give a broad, level base to the cavity.

The non-cohesive gold to be used should be in the form of cylinders, and the cylinders should be sufficiently large so that when laid along the floor of the cavity with the ends facing the buccal and lingual walls and there compressed, the layers of foil forming the cylinder will be wide enough to extend from the wall of the cavity nearest the pulp to the cervical border, and overlap it.

The portion of the cavity in which the filling should be started in these cases is usually in the angle formed by the junction of the lingual with the cervical wall, or, in other words, in the cervico-lingual corner. This statement is made with the reservation that no one method of procedure can safely be followed in all cases. We cannot always obtain an ideally formed cavity, and any modification in the form of the cavity may modify the starting point of the filling, as other processes of operating are modified by circumstances.

A large cylinder of non-cohesive gold is laid on its side in the cervico-lingual corner, with one end looking toward the buccal wall and the other slightly turned up toward the occlusal surface. This is carefully "coaxed" into position without breaking up the layers forming the cylinder or disintegrating the mass. No attempt is made to condense the first cylinder. It is partially compressed to ascertain whether or not there is going to be a sufficient mass of gold, which, when condensed, will perfectly fill any undercut, and extend across the floor of the cavity and slightly overlap the cervical border. In shallow cavities one cylinder, of a size so large that it will barely pass through the orifice of the cavity without being torn or disintegrated, will sometimes accomplish this, but in many cases it will require two or three cylinders before a sufficient bulk of non-cohesive gold is obtained. When the required amount is in position, a smaller cylinder of cohesive gold is annealed as thoroughly as can be done without melting the outer layers of foil, and this is placed upon the uncondensed non-cohesive gold. A plugger point, shaped to conform somewhat to the walls of the cavity, is then brought down upon the cohesive cylinder, and force by

hand pressure is exerted to drive the mass directly toward the cervico-lingual corner. This wedges the gold firmly into the angle of the cavity. The non-cohesive gold is irresistibly carried before the cohesive, and is adapted to the walls without being punctured and squeezed out of the cavity, as would be the case if the plugger point were brought directly upon it. The cohesive cylinder, when thoroughly annealed, forms an impenetrable mat against which the plugger may be pressed with sufficient force to insure adaptation and condensation, without breaking up the mass of gold into fragments. The cohesive gold is carried into the substance of the non-cohesive, and lends solidity and stability to the first portion of the filling. The only means by which these first pieces of non-cohesive gold can be condensed independently of the cohesive cylinder without danger of disintegration, is by the use of broad-pointed pluggers, and with broad pluggers there is no assurance that adaptation is perfect in undercuts or grooves. The spreading qualities often attributed to non-cohesive gold must not be depended on to any appreciable extent. It is probably safer to assume that gold, whether cohesive or non-cohesive, will go only where it is forced to go by definite and direct pressure, than to depend on a lateral moving of the mass when the plugger point is brought to bear squarely upon it.

When the first pieces of gold are anchored in position it will be found that the cervico-lingual corner of the cavity is well covered over, with the gold extending further along the cervical than the lingual border. It is sometimes necessary to use two or even three cylinders of cohesive gold to overlie and protect the non-cohesive, but no cylinder except the first should be annealed to a high temperature. The object of high annealing in the first cohesive cylinder is to obtain a mass of gold, the layers of which will weld on the slightest pressure, so that when the plugger point is brought against it the layers cling together so tenaciously that great force may be exerted without puncturing it. This quality not being so necessary in the succeeding cylinders, they are rendered only semi-cohesive.

When the filling has progressed thus far in the ordinary cavity of a bicuspid, it will usually be found that the gold extends more than half way across the cervical wall in the direction of the buccal wall. The conformation of the cavity viewed at this stage of

the operation shows a decided depression at the cervico-buccal corner, and into this depression a cylinder of non-cohesive gold is placed, in the same general arrangement as with the first cylinder in the cervico-lingual corner. The end looking toward the lingual wall will slightly overlap the gold already in place, while the other end will curve toward the occlusal surface along the cervical third of the buccal wall. The same plan of anchorage is followed here as with the other corner, a retaining instrument being held firmly against the condensed portions of gold to keep the mass from moving while the process of wedging between buccal and lingual wall is progressing. When the span is made between these two walls and the gold thoroughly condensed along the whole cervical outline, and up the cervical third of the lingual and buccal walls, we have a firm foundation for the filling, which, if the cavity has been properly formed, cannot be tipped or dislodged in any way by mallet force during the subsequent process of the operation.

Up to the time when the connection is fully made between the lingual and buccal walls, and the cervical outline well covered, a mallet of any kind is ordinarily contraindicated. Hand pressure vigorously exerted in the proper direction will insure good adaptation, with less danger of injury to margins. After the floor of the cavity is covered, a mallet should be used to complete the condensation. The first blows should be struck midway between the buccal and lingual walls, and the plugger point carried in either direction from the center toward the walls, the last blow coming on the gold immediately overlying the walls.

The cavity is now filled about one-third full. A cushion of non-cohesive gold covers the margins, while solidity is secured by a layer of semi-cohesive gold over it. The filling is slightly higher along the buccal and lingual walls than in the center, while the whole mass is firmly anchored in place. The most difficult part of the operation is completed, and the process from now on consists merely in building back and forth between buccal and lingual walls. This, for the most part, is done with semi-cohesive gold, but at any point in the cavity where there is a decided undercut or groove, a cylinder of non-cohesive gold should be laid into it and driven to place with a smaller cylinder of cohesive gold. As the surface of the filling is being reached, and all margins are pro-

tected, the gold should be annealed thoroughly to gain the benefit of its greatest cohesive properties.

When the occlusal portion of the cavity is approached a definite plan of anchorage should be followed to insure firmness of the filling at this point. If the groove running between the cusps and leading to the depression near the opposite marginal ridge is deep, a cylinder of non-cohesive gold should be laid in it with the ends looking mesially and distally. A cohesive cylinder should be placed upon this and thoroughly condensed into it, the end of the latter overlapping the cohesive gold already in place. From this point to the completion of the filling, the gold should be made as cohesive as possible. Where the groove is shallow, cohesive gold should be used throughout the entire occlusal portion of the filling. In case the depression near the opposite marginal ridge dips into the dentine much deeper than the groove between the cusps, it should be filled with non-cohesive gold nearly to a level with the floor of the groove before any gold is placed in the groove itself. In these cases the groove is usually shallow, and we now have two sections to the filling—the main body in the proximate cavity, and the smaller piece in the depression on the occlusal surface. A cylinder of cohesive gold is then placed in the groove, with one end overlapping the distal section and the other the mesial, and condensed so as to bind the two portions together. Gold thoroughly annealed is used to complete the filling.

It will be seen that the general arrangement of the different forms of gold in a filling of this kind is as follows: Non-cohesive gold lines the cervical portion of the cavity and fills any deep depressions or undercuts; semi-cohesive gold forms the bulk of the filling, while a decidedly cohesive gold covers the surface.

The selection of plugger points for this method of filling is important. The question of form cannot be treated upon in this paper, but a word may be said as to serrations.

For the purpose of fastening the first pieces of cohesive gold into the substance of the non-cohesive, pluggers with deep serrations are called for. Deep serrations secure an interlacing of the layers, and result in a more stable union between the two forms of gold than can be accomplished with shallow serrations. In the process of building up the filling with semi-cohesive gold when we are simply adding piece after piece to the main mass to increase its

bulk, and not working around margins, deep serrations are indicated on the same principle. But in condensing over margins deep serrations are dangerous, on account of the tendency to puncture the gold and injure the enamel borders. Shallow serrations should be used along all margins. As the surface of the filling is approached and the gold is rendered more cohesive, the necessity for deep serrations passes away, and the best results are obtained by using shallow serrations. When the last piece of gold is in place, condensation may be completed with pluggers having no serrations.

The statement just made with regard to deep serrations applies only to hand pressure, the hand mallet, or automatic mallet. With the engine, electric, or any of the rapid acting mallets, deep serrations are contraindicated.

## CEMENTING FILLINGS IN.

When contour gold or amalgam fillings drop out, and the margins of the cavities are not found destroyed by decay, they can be reset with thin cement and made to stand for years. The cavity and the filling must be thoroughly cleansed and dried before applying the cement, which can be more easily applied to the filling than the cavity. The dam must be on.

Many dentists are now advocating the use of thin cement in cavities into which gold or amalgam is pressed, the cement allowed to set, the margins of the cavity freed of the cement and the filling continued. The cement is claimed both as a retainer and protector.

## GOLD AND AMALGAM AS A BASIS FOR FILLINGS.

DR. W. F. SIMONTON, CAMERON, W. VA.

International Dental Journal, March.

The following method of treating approximal cavities of molars and bicuspids has given me better results than any other. It is, or might be called, a modification of the method of filling partly with amalgam, and letting it harden, and finishing the filling

with gold at a future sitting, or of Dr. Clapp's method—of finishing all at one sitting.

Let us consider, for instance, a distal cavity in the first molar, and a mesial cavity in the second, perhaps as difficult an operation of the kind as any dentist will be called upon to perform. First, secure sufficient space by pressure or cutting, or both, for this must be obtained to allow the operator to see all parts to be operated upon. Prepare the cavity by cutting back the walls, if possible, until sound enamel is reached, especial attention being given to the lower or cervical wall; cut it down until it is smooth and strong, with an abutment of dentine back of it, and do this even if it carries the cervical wall below the gum margin, and do not trust, if it can at all be avoided, a thin bevelled cervical wall. Cut a retaining groove across the cervical wall or bottom of the cavity, letting it extend up the sides out through the coronal enamel, if a coronal opening has been given to it. At the ends of the groove across the floor, where it turns up the sides, make the angles somewhat acute or with slight pits; and the groove across the floor should be far enough from the enamel to leave standing a small abutment of dentine between the groove and the enamel. Prepare a small piece of amalgam, well washed with alcohol and pressed dry with pliers, and place in the cavity, to fill or nearly fill the retaining groove, but be careful to keep the amalgam back from the enamel or outer edge of cavity at the cervical border. Now place on the amalgam small pieces of gold, not pellets, but foil folded and cut in very small squares. I use Williams's crystalloid, No. 3, cut in pieces a line or less square, or small bits of Stuerer's or Watt's crystal. Press these first pieces down lightly, using a small instrument and applying it all over the gold; and soon the mercury will show through the gold; then apply more gold, letting it extend to and beyond the cervical edge of the cavity.

It may be well here to diverge somewhat to speak of cavities where it is impossible to leave an abutment of dentine at the bottom, because the dentine may be decayed below perfect enamel, and the decay extend out to the enamel at the cervical wall. This will give a pocket or pouch-shaped space alongside the enamel at the cervical border. If so, be careful not to fill this pocket full of amalgam, the idea being to have only enough to furnish mercury to amalgamate the first few layers of gold next to the cervical

border. After the mercury ceases to show through, press the gold down firmly, packing it in the angles or pits at end of lower retaining groove, which will be found to hold this part of the filling securely. The filling will now be about the eighth of an inch above the cervical wall, and firmly held by the ends of the retaining groove. Proceed now to condense and finish, first using pressure by means of a burnisher or any suitable instrument, afterwards the mallet, if thought necessary; but pressure is generally sufficient, and it avoids danger of shattering or crumbling this wall. Start the filling in both cavities before completing either, but commence the filling in the distal cavity, as it is more convenient, and complete the filling in the mesial cavity first, as a portion of the front teeth being removed gives much better access to the mesial cavity and also admits the light, while if the mesial filling is completed and partly finished, it acts as a reflector on the distal cavity, and makes it much lighter during the filling.

By following this method and not using any matrix, we get an amalgam or substance for filling the cervical portion of the cavity that is soft and tough and easily adapted to the enamel edge. Be sure that this important part of the work be well done, and no overlapping of the filling left at the cervical wall. This opportunity to finish will be more appreciated by recollecting the difficulty at the cervical border, where the teeth are long, or the filling extends to or under the margin of the gum or the neck of the tooth is small, and that portion of the tooth next the gum slopes from a large coronal surface to meet a narrow neck. In short, the method tries, at least, to take into consideration the fact that these fillings almost always fail first at the cervical border, and are also most difficult to make properly here. The use of the matrix cuts off all light at the cervical border. The enamel may be injured by the first few blows of the mallet, or a small portion be scaled off, but the operator knows nothing or little of this after the filling is commenced.

If it be desired, a matrix may at this point be applied for finishing the filling. This method of starting a filling and of finishing the cervical portion is often useful in approximal cavities of incisors, whether there be only one or two fillings that face each other; it is often an excellent plan to put in the cervical part of the filling and at least roughly trim off the surplus gold, as we get

much better access to and can see the cervical part more clearly before the main body of the filling is inserted.

## TIN FOIL FILLINGS.

DR. W. C. BARRETT, BUFFALO, N. Y.

Dental Practitioner and Advertiser, July.

The average gold worker, when he attempts to use tin foil, seeks to employ the same kind of manipulation with it that he does with gold foil. But the characters of the two metals are widely at variance. Gold can be made to cohere. One particle can be added to another, and actually welded to it. This is not the case with tin. It does not weld, and the most that can be done in consolidating it is to so intermingle the surfaces of two pieces that they seem practically to be one. A pellet of thin gold foil can be laid upon a bar of the same metal, and by the impact of a smooth instrument united to it. Not so with tin. Under like circumstances it would be found necessary to use a sharp-pointed instrument, and by a succession of indentations to drive the particles of the one piece into the other. Hence the impact of a mallet is out of place in consolidating tin. It is impossible to add pellet to pellet, and by hammering with a mallet to build up a filling, as with gold.

The best way to insert tin is to use it in the form of cylinders, following the instructions laid down by the early operators for using soft gold. In the early days dentists were unacquainted with the welding properties of gold foil, and depended upon wedging it in. That is precisely the manipulation proper for tin foil, which has the qualities that gold was formerly thought to possess. Cylinders of different sizes should be prepared by rolling strips of folded tin foil about a smooth wire. These are then placed on end in the cavity to be filled and pressed laterally toward the periphery, the end being allowed to project. Another cylinder is added and pressed toward the margins, and this process is continued until the walls are completely lined by the cylinders. More are added in the center until the cavity is filled. Then, with a sharp-pointed excavator, or a plugger of analogous shape, the surface is examined to see if there be any imperfections. If there are, the instrument is worked down into the filling, lateral pressure being almost exclusively used.

When the hole is sufficient another small cylinder is inserted, and this is continued until the instrument can no longer be worked into the filling.

Then commences the consolidation of it by means of serrated condensers. For the first time pressure, nearly in the direction of the axis of the tooth, is employed. Heretofore all pressure has been lateral. By hand pressure the surface is gradually condensed down, the projecting cylinders forming the surplus material, until a dense filling is the result. It must be understood that nothing save the ends of cylinders are presented. In no case should the tin be arranged in layers, for they are likely to flake off. If there is a deficiency of material at any point, more tin should be added, by working a hole into which another cylinder may be inserted with a projecting end, which subsequently can be condensed down. The mallet should not be used, because under its blows the tin is literally chopped out. If a filling inserted in this manner be ground down upon its surface with a corundum stone, its density and durability will surprise many experienced dentists.

Of course, the class of cavities to which tin is best adapted are those with four walls, but a compound cavity, involving the crown and approximate surface, may be readily filled with tin, by so arranging the cylinders that their ends shall be presented wherever the filling is exposed. But two kinds of pluggers are needed, wedge-shaped ones for inserting and pressing to place the cylinders, and round or square condensers for consolidating the surface.

## CHANGING COHESIVE GOLD TO NON-COHESIVE

Dr. Black's method of making non-cohesive gold, is to place a book of gold in a drawer in which there is placed some ammonia, on a piece of cotton, if preferred. An open box or vial of cylinders will also become non-cohesive in the same way.

## COPPER AMALGAM.

DR. G. A. M'MILLEN, ALTON, ILL.

Dental Review, March.

In speaking on this subject, the author said he had been in the habit of squeezing the mercury from the amalgam, but that he had discovered this to be wrong, and that decidedly better results were obtained by using the mass soft, retaining all the mercury, that dry copper amalgam was sure to wash out, disintegrate.

## PREPARING AMALGAM.

DR. HATHAWAY.

International Dental Journal, September.

The preparation of the amalgam for the cavity is, I think, best made in the following manner, suggested first by Dr. Rollins: The powder is placed in the mortar with a small quantity of a one or two per-cent. solution of sulphuric acid, the requisite amount of mercury added, and the mass rubbed up before the acid is poured off; the pellet afterwards washed in clean water. I do not believe in working amalgam as dry as some advocate. I want it plastic enough to pack well, and like to have it packed before crystallization has far advanced. The quality of mercury used is a matter of consequence, and may explain some of the difficulties with amalgam.

## COPPER AMALGAM WITH SILVER.

DR. THEO. JOHNSTONE, NEWBERRY, S. C.

Dental Cosmos, June.

A crystalline salt is supposed to contain water of crystallization and water of constitution. The first, in some instances, is dispelled at ordinary temperatures of the air; the second is more intimately united, therefore will require a more elevated temperature to dispel it.

Apply this fact as a theory to amalgams, that they have mercury of crystallization and of constitution. In some instances could not we reasonably expect a part of the mercury of crystalli-

zation to be evaporated when the temperature of the mouth exceeds the temperature necessary for its volatility?

We often notice with some fillings a change about the margins of cavities, not so smooth as when first finished; such troubles, I believe, are not found when copper amalgam is used, if the condition of the mouth indicates its use. It can be highly recommended in some cases, but there are times when it will not become hard in the mouth. I do not know, and cannot even suggest, a cause for this; but this objection can be overcome by the addition of a small amount of silver filings:

Copper amalgam, gr. xii.
Silver filings, gr. ii.

Soften the copper amalgam in the usual way for filling, then add the silver filings, working it in till amalgamated. Squeeze out excess of mercury, and it will be found to harden or crystallize in a short time.

This preparation can be used over time and again, as copper amalgam is, adding mercury when too dry. The addition of silver will make it set very quickly.

## AMALGAM AS A RESTORER IN EXTENSIVE LOSS OF CORONAL SURFACES.

DR. W. B. SHERMAN, SAN FRANCISCO.

Dental Cosmos, October.

The author, after deprecating the lack of coronal and contour building of amalgam, gives the following illustration of what may be done with amalgam in extensive work.

Let a mouth present in which one or two teeth have been lost, and where those remaining have arranged themselves so as to leave considerable space between each tooth, and we have a case where amalgam can furnish more or less additional masticating surface.

In such cases, great annoyance comes from the packing of food between the teeth, necessitating, in proportion as one has nervous attributes, its immediate removal, or no comfort is possible in eating. The bridging of these spaces by amalgam from one tooth to another will accomplish both purposes. It must, however, be done

rightly and with the proper grade of materials. At first one space was alone bridged, but we now have record of a few years' standing of such cases where two, or even three, contiguous spaces were so treated, and successfully, as the result has shown.

It is admitted that cavities must either exist advantageously placed, or must be so made. A distal or disto-morsal cavity in one tooth must have as its counterpart a mesial or mesio-morsal cavity in the tooth next in line. Where it is desired to bridge over two contiguous spaces, the tooth between these spaces may be of almost any abnormal shape. A mere root can be utilized to good advantage as a pier to the bridge. When a tooth is normal, conservative operators may, however, hesitate to mar its natural outlines for this purpose. Let the urgency of the case decide this. An advantage secured many times in this operation is the support given to loose teeth, it being recognized in this direction that such loose tooth must stand between the space to be bridged, and the amalgam made continuous over this, to insure the best results; for a loose tooth at either end of the bridge would soon work itself free from a close adaptation with the amalgam, or at least the conditions for fracture of its walls would be present. For the successful accomplishment of such an operation two grades of amalgam alloy should be used. This is especially true where the decay has advanced near to or under the gum-line. Some good, recognized submarine alloy should be first employed, and the adaptation to the cervical margin made perfect. Half of the cavity from the gum toward the periphery of the tooth should be filled with this grade of amalgam, and the bridge completed with any high-grade, heavily silvered gold alloy. Such an alloy is found in Flagg's "Contour." This grade of amalgam in its setting is firm, prompt and dense, with excellent edge strength, attributes which alone make possible the successful use of amalgam for bridging, and which give the successful plastic-worker such satisfaction in his work. Distal and mesial cavities are prepared as though for simple filling, care being taken to leave no overhanging wall of enamel upon their sides, for this would be sure to fracture under the strain. After the submarine amalgam has been introduced to its proper level in the cavity, a small roll of chamois-skin, suited in size to the space it is to occupy, is placed between the teeth and pressed down hard upon the gum, which latter should have been previously treated by a cocaine appli-

cation. Chamois-skin is used in preference to cotton, as there are no fibers, and as it leaves a better finish to the amalgam surface.

The high-grade alloy is now worked in upon the submarine, while the latter is yet plastic, and over the chamois to the submarine in the second cavity. Its hardening is hastened by pelleting.

The application of the rubber-dam should have preceded the introduction of the filling material. The distal cavity should receive attention first, working from before backward, thus facilitating the work. Proper articulation with the antagonizing teeth is made after sufficient hardness is obtained and the dam removed. Caution should be observed in the closing of the teeth not to fracture the bridge, and the points of contact marked by articulating paper.

The tedious part of the operation is now at hand: the making of the proper depressions to receive the cusps of the opposing teeth, and the rounding off of the cusps themselves. It is well to allow the material to harden thoroughly before it is removed. If the proper grade of alloy has been used, one-half hour's time should give it ample scope in which to do this. The roll of chamois-skin should be left until the patient is discharged, not longer, as separation of the teeth might occur, and make futile our efforts. Two or more contiguous broken-down teeth have been treated with good results, the satisfaction to the patient being manifest in a few days, after the novelty of the innovation has worn off. Objection to this operation may be made by its establishing pockets for the retention of the food. This objection is tenable, and if habits are slovenly in regard to the care of the teeth, may hold good; but where care is used and a tooth-pick kept at work it becomes of no importance.

If it is found that space enough was not left after the withdrawal of the chamois-skin, a few revolutions of the fissure-bur will increase it. It has been pertinently asked: What are the limits of the successful application of plastics? It is not yet time to answer that question.

## LINING THE CAPITY FOR AMALGAM.

It has been suggested to line the cavity to be filled with amalgam with aluminum foil. It will not amalgamate, therefore preventing discoloration.

## TO SMOOTH APPROXIMAL SURFACES OF AMALGAM FILLINGS.

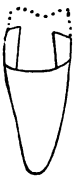
DR. D. J. WAIT, HELENA, MONT.

Procure ribbon, such as is used for binding seams of ladies dress waists, which is very thin and smooth; insert the filling flush with the edges of the cavity, then, by properly using the thin ribbon, the filling may be smoothed very quickly and nicely; after the filling has hardened it may be polished in the same manner with the aid of polishing powders same as for gold.

## AMALGAM RESTORATION.

DR. B. H. CATCHING, ATLANTA, GA.

Where a molar or bicuspid is decayed through antero-posteriorly, leaving only the outer and inner walls intact, grind down the walls, as shown in the cut, beveling the tops at the expense of the inner and outer sides. Fit a band of German silver, copper or stencil cutter's brass, soft solder it, place on and trim to the proper height for the occluding teeth. Fill full with amalgam, allow the antagonizing tooth to press upon to form the articulation, trim away the surplus amalgam. Let the band remain on for twenty-four or forty-eight hours, cut it off and finish up the filling. The dotted line shows the amalgam masticating surface.



## ABSCESSES, INDURATED, TREATMENT.

Deutsche Monatsschrift fur Zahnheilkunde.

Michaelis obtained good results in the treatment of indurated abscesses by means of iodine. Carbolized chalk is mixed with glycerine and crystals of iodine incorporated. After opening and cleaning the pulp canals, the remedy is introduced into the pulp chamber and the cavity closed with cement. The remedy must be freshly prepared every time.

# SURGICAL TREATMENT OF ALVEOLAR ABSCESS.

DR. L. E. CUSTER, DAYTON, OHIO.

Ohio Dental Journal, January.

During the development of an alveolar abscess the peridental membrane sometimes becomes stripped from the end of the root, and if the end remains bathed in pus for any length of time, the membrane fails to reattach and this portion of the root is then dead. Although the first cause of the abscess may now be corrected by disinfecting and filling the pulp canal, the dead cementum, rough, partially resorbed, and perhaps covered with serumnal calculus, is sufficient cause for a persistent formation of pus, and its excision is then indicated.

The operation is not a new one, by any means. It is quite easily performed on the anterior teeth, but on roots of molars and bicuspids it is somewhat difficult, owing to their flat shape and the difficulty of operating in that part of the mouth. There is less danger associated with this operation than with the extraction of a tooth. Care should be used when operating under the antrum that the floor is not perforated.

The sinus leading from the apex of the root is not always the shortest route, but is often tortuous, and in the majority of cases opens towards the crown.

It is not absolutely necessary that the apex of the root be exposed, but it is better, if it is possible, to do so. It is seldom that there is any alveolus just over the apex in a chronic abscess, and if the sinus does not open here, an incision may be made through the gum, and this enlarged by tents. Instead of cotton for the purpose, let me suggest the use of the sponge tent used in gynecology. I tried sea-tangle tent, but only once; it could hardly be removed. The sponge acts beautifully and may be easily removed. A piece cut the size of the opening will expand enough, so that one insertion is sometimes sufficient.

Free access having been gained, and the point of excision having been determined upon, it has been my practice to drill directly through the middle with a No. 3 spear-pointed drill, then follow with a No. 3 fissure point, pressing it laterally on either side till the end is separated. If you bear a little towards the crown at

the same time, the end will be somewhat rounded. By using the spear-drill first an idea of the root's diameter is obtained, and there will also be no slipping of the fissure drill, as is likely to occur if you commence with instrument on the side of the root.

After the apex has been excised, it is advised to smooth the edges of the new end with proper points. This is the correct thing to do, and if you are sure you can perform this delicate operation without doing more cutting along the side of the root than on the sharp corner do so. If you have handled the fissure drill well the end left by this will be somewhat round and quite smooth, and nature will take care of the sharp edges better than the ripped-up peridental membrane and the roughened cementum which was done in your efforts to smooth the corners.

The end presented after the operation of excision is largely dentine; although this is dead, it has been disinfected, and the pulp canal filled, and is so dense and smooth as to be a non-irritant, and becomes encysted. The cementum around it is alive and nourished by the peridental membrane, and if there is no dead alveolus the irritation produced by the operation and the freshening of the walls of the old pus tract stimulate healthy repair and the sinus closes with little if any therapeutical assistance.

## SPREADING GOLD IN FILLING.

DR. E. A. BOYCE, CHICAGO.

Dental Review, December.

The writer speaks with force and reason in favor of round-faced instruments for spreading gold. He says a flat-faced instrument will not spread, and describes his favorite instrument, the face of which represents the arc of a circle, fashioned very much like a pestle. This leads to the suggestion that from round-headed burs suitable instruments may be constructed.

## PAINLESS ALVEOLOTOMY.

A method attributed to Dr. Black and others is to dry the gum, and then with a plugger a drop of carbolic acid is placed

directly over the place where the apical space is supposed to be, letting it rest a moment; then commence removing with an instrument the tissue. In a few moments apply another drop of acid and remove as before, repeating this from time to time, and in a short time the alveolar process can be penetrated, and with a bur drill make the entrance direct to the apex of the root.

## MAKING AND PLACING CORNER ON SUPERIOR CENTRAL WITH LIVING PULP.

DR. B. H. CATCHING, ATLANTA, GA.

A boy at play broke off a large corner of a superior central. After waiting sufficient time to see if the pulp would survive the shock, the corner was restored with gold, as follows: From an impression of the tooth a plaster model was made; the corner was restored with plaster, allowing for the thickness of the gold plate. From this model a model was made in clay with fusible metal; on this a gold corner was fitted, removed and soldered. The enamel edge of the cavity was beveled; small holes were drilled in the cervical and cutting walls, avoiding the enamel and the pulp. Into these holes German silver wire the size of the drill with threads cut on them was screwed. A piece of small wire was held across the fracture, between the inserted wires, and they were bent over it, forming a staple in the tooth. The wires were about one and a half inch lengths, which made it easy to bend them over. They were cut off with corundum wheel. The corner was put on and a small hole made through it from labial to palatine surface, passing through the staple. With everything dry, the corner was filled with cement and pressed to place. A small gold wire was pressed tight through the holes, trimmed off even and the whole finished up.

## GOLD CORNERS FOR PULPLESS TEETH.

DR. E. R. VAUGHN.

Items of Interest, August.

After the roots have been treated, the apex successfully filled, and all soreness has passed away, cut away with a sandpaper disk

all uneven edges, till you have brought the enamel margin to a perfectly flat surface. Enlarge the canal for about two-thirds its length, and fit snugly a pin of fine gold, allowing it to project to the biting edge of the tooth. Remove the pin, take a piece of pure gold plate a little larger than the surface of the cavity, lay it over the surface and drill a hole corresponding to the enlarged nerve canal, start the pin through the hole and drive to place. Remove pin and plate and solder together. Replace, and with a corundum wheel in engine, grind the plate even with the margin of the enamel. Build up the corner as you desire it when finished, with wax, remove, and invest in plaster and marble dust, the pin down. After the investment has thoroughly hardened, work out the wax and melt into the mold, formed by it 22 k. solder, "spatting" it down with a steel instrument before it cools. Before finishing, it may be well to try the piece in, and grind down any places on the surface which are not perfectly level with the enamel, finish, cement to place, and you have a corner which will not scale or pit, and will outlast any corner which can be built of foil.

## COHESIVE FOIL AND HOW TO USE IT.

DR. S. H. GUILFORD, PHILADELPHIA.

Items of Interest, May.

While the manufacturer to-day produces cohesive foil of a far better quality than he did twenty years ago, it is often defective, because the annealing is too great, thus making the foil less tractable than it should be. For this reason the dentist who makes large use of cohesive foil generally prefers to buy that which is only slightly cohesive, and to render it more so, when desired, by annealing it himself at the time of using. Experience has shown that the quality of cohesiveness can be imparted to foil more delicately and with a wider range of degree by the dentist than the manufacturer, for he can vary it according to his needs.

There is a point in the process of annealing, well known to the experienced, which gives to the gold sufficient cohesiveness for all purposes without lessening its adaptability, whereas, if carried beyond this point its best qualities are impaired. Careful and

proper annealing, therefore, is one of the most important considerations in the manipulation of cohesive foil.

The extent to which annealing may be advantageously carried depends on the thickness of the foil and the manner in which it is to be applied. In the heaviest grades of rolled gold intended to be used on or near the surface, or where the entire filling is to be made from it in large and accessible cavities, the gold may be heated to a dull red color, and the greatest degree of cohesion thus imparted to it without interference with its working properties, for it is intended to be laid layer by layer in a comparatively even and regular manner.

With the lighter grades of foil, prepared in the form of twisted ropes or folded ribbons, for use in less exposed cavities and throughout the filling where the same evenness of surface cannot be maintained, so great a degree of annealing would seriously interfere with the proper working of the foil, without conferring any real advantage. It has, therefore, been found best to give to the lighter foil, which is used throughout the body of an ordinary filling, only slight cohesiveness, reserving the greater degree for surface work, where more perfect cohesion is required. The semi-cohesive variety of foil, which does not unite on casual contact, but will allow one surface to glide over another without interference, and which only becomes united under pressure, is the kind best adapted for the main portion of all ordinary or medium-sized fillings. When nearing the surface the same gold slightly annealed will give to the filling that uniformity of texture and density so necessary to usefulness.

As to the manner of annealing foil, various practices prevail; some passing the foil through or near the naked flame, while others, preferring not to expose the gold thus to the products of combustion, heat it on a tray of metal or mica held over the flame. The latter would seem to be the better way of avoiding overheating, but experience shows that equally good result follow the use of the former method, provided proper care be taken. To avoid overheating by this method with the lighter grade of foils, as well as to attain the proper degree of cohesiveness without harshness, the gold should never come in direct contact with the flame, but be passed quickly just above it. There seems to be no preference between the use of alcohol or illuminating gas for annealing, provided the

latter is used in connection with a Bunsen burner, affording perfect combustion.

One interesting fact remains to be mentioned in connection with the subject of annealing. For years it has been generally claimed and believed that the so-called strictly non-cohesive variety of gold could not be made cohesive by annealing, but we have recently satisfied ourself by experiment of the fallacy of the idea. Annealing it in an alcohol flame of moderate size does not materially change its quality of non-cohesiveness, but when heated to redness in the large flame of a Bunsen burner its condition becomes so greatly changed that it can be as easily and perfectly welded as cohesive gold. Treated in this way, however, it differs from the ordinary cohesive gold in the fact that pieces coming into slight contact do not cohere, and that mallet force in some form is necessary to bring about the desired union.

Another important feature to be considered is that of the form and character of the points used in the condensation of cohesive foil. If gold is torn or lacerated in the course of introduction, additional labor and time will have to be expended in again bringing the severed portions into absolute union. It is therefore the part of wisdom to avoid such severance. This can only be done by using points with the finest and most delicate serrations on their surface, and that are free from any sharp angles. In addition to this, the face of the instrument should be of such size as to cover considerable surface, and thus avoid piercing the different layers. As we have already shown, cohesion takes place most readily and perfectly when the surfaces of the different layers are brought into absolute contact at all points. This is best accomplished by keeping the surface of the filling as nearly uniformly even as possible, and broad-faced instruments should be used for this purpose.

Instrument points with just sufficient convexity to avoid flatness, and with distinctly rounded edges, will produce better results than any others in welding gold.

Fine serrations, while they are unobjectionable and produce good results in connection with slow malleting, where rapid malleting can be employed, as with the mechanical or electric mallet, even more perfect results are obtained by the use of smooth points, or those with but the faintest trace of roughness on them. Points of this character, of as large size as can be conveniently employed,

used in connection with cohesive gold of any form, will produce a filling so compact and homogeneous that it will never scale or pit, but always preserve the perfect surface given to it at the time of finishing. A filling of this character will have not only the appearance but the essential qualities of a mass of cast gold.

The pitting and scaling of cohesive foil fillings which have at times filled the heart of the ambitious young operator with dismay, and have been the cause of much of the opprobrium that has been cast on the employment of cohesive gold, are attributable to too great cohesiveness of the gold and to deep serrations and finely pointed instruments, or the use of foil so thin and delicate as to be easily torn and comminuted. Foil of greater tenuity than No. 4, as furnished under the names of corrugated, velvet, and the usual form of Wolrab gold, can only be safely manipulated in mass in the form of cylinders, mats or rolls, and then only in connection with broad and finely serrated instruments, employed with the greatest care to prevent laceration.

## PINK GUTTA-PERCHA; SOME OF ITS USES.

DR. H. BARNES, CLEVELAND, OHIO.

Ohio Dental Journal, February.

Pink gutta-percha is to be found in every well appointed dental office, and is probably used for more purposes than any other one material in our possession. A few are here mentioned: As temporary fillings in cavities already prepared, when want of time or other causes prevent the insertion of a permanent filling; as temporary fillings in large cavities not prepared, to prevent nerve exposure until such time as patient or operator may find time to devote to permanent filling; as a wedge between teeth separated by cotton, rubber or other means, to allow inflammation to subside and retain space during the operation of permanent filling; as a wedge between teeth, having large spaces from extraction or otherwise, standing next to the one being filled, to distribute the force of the mallet blow, and thus securing to the patient the greatest possible comfort; as a rest under the arm of the Perry separator to secure the instrument from rocking, slip-

ping, etc.; as a separator and rest for the jaws during operations; as cones to force chloro-percha into every portion of the nerve chamber. It may also be used to make small handles for the broach, thus securing a better hold and more perfect manipulation of the broach during nerve extraction, especially when the approach is from the distal surface; also wound around the ends of a ribbon saw and making a secure handle for this instrument; also for separating teeth; also held on the end of an instrument, and heated to determine the life or death of the dental pulp or nerve. Used as chloro-percha to fill root canals and making the most perfect filling for this purpose (universally used) which has yet been brought to our notice; to repair the break in the rubber dam; to secure remedies within cavities, when mixed with cotton.

We injure our hand or fingers, and at such times, if we immediately suck the wound and wash with bichloride mercury solution 1 -1000, thoroughly dry and smear over with chloro-percha, all danger from infection is removed, and the wound will immediately heal. For filling some of the molars when it is impossible to apply the dam, a band of German silver or other metal smeared on the inside with chloro-percha and then forced over the tooth will prevent the moisture from interfering with the work; it is also an excellent article to flow over the inside of the cavity when the nerve is nearly exposed and when it is desired to cap with cement.

## CEMENT UNDER AMALGAM.

DR. J. C. ST. JOHN, MINNEAPOLIS, MINN.

Dental Review, December.

The writer says to get the best results from this combination only a thin coating of cement is necessary. He puts into the cavity some thin oxyphosphate and presses in some amalgam, with sufficient force to press the cement to a thin layer, and which is forced to the edges of the cavity, from which it is removed and the amalgam filling finished. His idea is that only a sufficient quantity of cement is needed to break the joint between amalgam and tooth.

# AID TO FILLING CERVICAL CAVITIES IN INCISORS.

DR. H. BARNES, CLEVELAND, O.

Ohio Dental Journal, February.

Take a piece of tin or other metal one-third of an inch wide and long enough to surround the tooth to be filled, fasten the end with thread or other means, pass over the tooth, allowing the metal to slide over the cavity between the gum and tooth and with a burnisher crowd down and bend over the edge as much as possible. This will expose the cavity to view and crowd the gum from the tooth, thus allowing of freedom during the operation, and it will also prevent moisture getting into the cavity. A thin coating of chloro-percha applied with a nerve broach will greatly assist in some cases. This method is a useful one in filling cavities on the distal surface of third molars where the gum has grown over the distal ridge.

# APPLYING MEDICAMENTS IN CAVITIES FILLED WITH GUM TISSUE.

DR. F. T. MURLESS, WINDSOR LOCKS, CONN.

Where the gum, through hypertrophy, intrudes upon a cavity into which it is necessary to immediately introduce a medicament, as, for instance, arsenic, it is sometimes impossible to keep the whole cavity dry and free from blood long enough to admit of satisfactory results.

In such cases, first apply creosote to the gum to check the flow of serum and prevent bleeding, then dry the cavity carefully, and after placing immediately over the pulp the portion of medicament desired, melt over it with a warm burnisher a bit of paraffine, which has been previously carried to place. While occupying but little space in the floor of the cavity this will be quite secure if the portion of the cavity to be covered is thoroughly dry. After the paraffine has solidified force gum back as an independent operation, using preferably the ten per cent. solution of aristol in chloroform

on cotton, or if desirable, the gum may be excised at this point By this method pressure on the pulp is avoided and, as paraffine melts readily, there is no danger from pain on account of heat.

## OBTUNDING SENSITIVE DENTINE.

DR. W. C. DAVIS, LINCOLN, NEB.

Dental Cosmos, September.

The writer in speaking of the dentinal tubes, says they are not filled with nerve fibers, but with protoplasm, which, he says, transmits sensation caused either by mechanical or chemical means.

In view of the fact that we know the cause of the irritation and the medium by which it is transmitted, and as this medium is not composed of nerve-tissue, and as its destruction is not permissible, nor its coagulation, owing to the jeopardy to the pulp, it is his theory that the only means by which the dentine will ever be rendered insensible to the surgeon's instruments is by the removal of the protoplasm from the dentinal tubuli. This would of itself be sufficient, were it not for the fact that the dentine is hygroscopic—capable again of taking up moisture; from within by capillary attraction, from without by contact with the atmosphere.

It is therefore his idea that, after the extraction of the protoplasm, we should deposit in its place another substance which is not in itself capable of transmitting sensation. The best means of extracting the protoplasm is the application of some agent not in itself injurious to the dentine or pulp, but which has a great affinity for moisture, of which protoplasm is very largely composed. Absolute alcohol is at once suggested. To assist its chemical affinity for moisture, it had best be applied warm, as heat assists chemical action and also favors evaporation.

If hot air is then applied, it will thoroughly vaporize the alcohol, carrying away the moisture it has extracted from the tubuli, leaving them empty. To whatever distance they have been emptied, to that distance we have destroyed the medium for transmitting pain. In other words, we have obtunded the sensibility of the dentine. The next step is to fill the tubuli with some other substance. He fills the tubuli with a resinous gum in suspension in a

volatile oil. Almost any one of the essential oils will answer the purpose, as they are composed of volatile oils and the resinous gum which we need. Probably nothing works better than oil of cassia, as upon the application of hot air the oil is easily volatilized, and if it has been diluted slightly with alcohol, it will readily go into the tubuli as far as they are empty, leaving its gum to fill the space. To this distance you can excavate with impunity; consequently, the success of the operation will depend upon the thoroughness with which you extract the protoplasm. In teeth of some structure, it seems to be readily extracted to a considerable depth; in others it is next to impossible. He does not think the failure of this method in some cases is due to any nerve structure or nerve complication, or nervous idiosyncrasies of the patient, but rather to the anatomical structure of each individual tooth and each individual cavity.

## TREATING SENSITIVE DENTINE.

DR. HENRY BARNES, CLEVELAND, OHIO.

Ohio Dental Journal, January.

After the dam is applied take Dr. Black's 1-2-3 mixture, or oil of cassia, wintergreen or other essential oils, on a pledget of cotton, placing the cotton in the cavity, and with chip syringe, having a platinum point, draw the heated air from the lamp, heating the nozzle of the syringe red-hot, blow gently onto the cotton until the oil is driven from it. This is done repeatedly, until the cotton looks as though scorched by fire. Now, removing the cotton from the cavity, we are able to cut out quite a considerable amount without pain to the patient. This is especially true of the leathery white, or light brown, decay found in the teeth of young children.

## ETHYL CHLORIDE AS AN OBTUNDENT.

DR. EDWARD EGLESTON.

Items of Interest, April.

He finds chloride of ethyl especially useful as an obtundent when cutting sensitive teeth. With a piece of dam large enough to cover

the nose and extending down over the mouth isolate the tooth, as it is important to prevent the inhalation of the ethyl chloride, for it is a general anesthetic, and one whose properties are little known. Now break off the lip of the glass tube containing the liquid, and direct the stream that gushes from the capillary tube on the tooth to be operated on. In thirty or forty seconds its rapid evaporation will lower the temperature of the tooth sufficiently to make excavating painless.

In such operations have the engine in position and everything ready to complete the excavating in as short a time as possible, as the local anesthesia will soon pass away. He has also used this successfully for the painless extraction of teeth.

## GALVANO-CAUTERY FOR SENSITIVE DENTINE.

Zahnarztliches Wochenblatt.

Fenchel recommends galvano-cautery for sensitive dentine; touching the dentine with the cautery at white heat, the pain is slight and the sensitiveness completely removed.

## OBTUNDING SENSITIVE DENTINE.

DR. L. VAN ORDEN.

Pacific Coast Dentist, July.

Carbonate of potash in glycerine, fifteen grains to the drachm, will sometimes produce a bearable pain while excavating. By preceding its application with oil of cloves less pain may be given, and the same should be applied afterwards. Tannin and glycerine is excellent for cervical cavities which have been made dry.

## TREATING SENSITIVE DENTINE.

DR. E. A. BOGUE, NEW YORK.

In sensitive dentine, when patients are extremely timid, Dr. Bogue dips a pledget of cotton into carbolic acid, and then into powdered cocaine, and places it into the cavity. This, he says, will

obtund the sensibility enough to use granulated chloride of zinc, with little or no pain. In ninety seconds the insensibility of the cavity is complete.

## VASELINE MIXED WITH CEMENT TO CORRECT IRRITATION.

DR. C. SILL, NEW YORK.

Dental Cosmos, September.

He mixes it with the powder in the proportion of sixteen powder to one of vaseline, grinding up together carefully before adding the fluid. It absolutely prevents the irritation, and his experience teaches him that the usefulness of the filling is in no way impaired.

## BURNISHING TEETH FOR SENSITIVENESS.

Dr. Holt, of Goldsboro, North Carolina, recommends this practice very highly for sensitiveness at the cervical portion of the teeth: Dry the tooth, heat the burnisher quite hot and burnish the sensitive part.

## FOR ADJUSTING DAM AND LIGATURE.

Dr. M. Hayter says a narrow foot gold plugger is excellent to tuck the edge of dam and to carry the ligature to place. The serrations prevent its slipping.

## DAM RETAINER CERVICAL CAVITIES.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Dominion Dental Journal, August.

Take a small-sized sewing needle; at the distance of, say three-quarters of an inch from the point, bend into the form of an S, the point of the needle forming the long leg, useful in filling labial cavities under the gum; stick the point into the neck of the tooth

below the rubber dam, just above the edge of the cavity, lift the upper edge of dam over the eye end of the needle, and the resiliency of the rubber will keep the needle in place and the cavity dry. It is far ahead of any clamp for the above purpose. To prevent the eye of the needle penetrating the dam put a little bead of shellac on the end.

## PAINLESS APPLICATION OF DAM AND LIGATURE FOR CERVICAL CAVITIES.

DR. F. VOWLES.

Dental Record, July.

A little full strength carbolic acid solution and crystals of cocaine muriate worked into it on a slab, is worked under the margin of the gum with a Donaldson bristle, and in a few seconds the dam can be passed painlessly and thoroughly up. Attach a long silk ligature to the tooth, tying it high; it is slipped over the decay with the end of a small double-ended burnisher, the ends of the silk are then secured to a piece of stick, and an assistant keeps it strained until the operation is concluded, thus resisting the downward tendency of the lip to pull off the silk.

## TO RETAIN RUBBER DAM.

DR. D. V. BEACOCK, BROCKVILLE, ONTARIO.

Dominion Dental Journal, July.

In cases where it is difficult to apply the rubber dam above the gum tie a knot on the silk; this will aid in carrying it under the gum; a double knot is sometimes necessary.

In some cases where it seems almost impossible to either hold or apply the dam to lower molars, it is a capital plan to take fine binding wire, double once or twice, twist about half an inch at the doubled end with a pair of pliers, run the free ends each side the tooth, to be enclosed at the necks near the gum—always from the lingual side—twist the ends on the buccal aspect of the tooth, and cut off the wire about half inch. The rubber can now be looped

over each end of the wire and held secure. This is better than any rubber-clamp ever invented for some difficult cases, as there is scarcely any tooth in the mouth, no matter where situated, if the wire can be applied, but the rubber can be put on by using it. A flattened pin is also very useful for applying the dam in many lower teeth, by slipping it between the teeth till the dam is secured by ligating.

To prevent rubber from slipping, dry the teeth well and apply a solution of sandarac varnish, or touch the necks of the teeth with powdered resin. This will often save ligatures. Rubber dam should always be touched with vaseline before applying.

## FOR DEVITALIZING THE DENTAL PULP.

M. PAUL DUBOIS.

Revue Internationale d'Odontologie.

For devitalization of the pulp, and with the minimum of pain possible, Mr. Dubois employs the following formula:

℞. Arsenious acid ..... grs. vj
Esèrine ..... grs. ij
Cocaine hydrochlorate ..... grs. ij
Oxide of zinc ..... grs. xv
Glycerine ..... grs. vijss
Chloroform q. s. to make a paste.

When the paste becomes thick, a few drops of chloroform can be added.

If the pain is violent at the moment the patient presents himself, that is, too violent to allow the application of the remedy, the following preparation is used:

℞. Carbolic acid
Morphia acetate, equal parts.

When the pulp has been devitalized by the first preparation, and to harden the pulp tissues before their removal, the following formula is used by the author:

℞. Chloride of zinc ..... ℥ ijss
Tannin ..... ℥ j
Alcohol ..... ℥ ijss

M. To be kept in contact for from three to eight days.

## FOR DISCOLORED TEETH.

Revue Therapeutique.

This journal recommends the two formulæ mentioned below for removal of the discoloration of the teeth following the prolonged use of solution of corrosive sublimate or boric acid:

℞ Sulph. depurat., 100.0 (ʒ xxv).
Ol. menth. piper., 0.5 (M viiss).

℞ Sulph. depurat., 50.0 (ʒ xiiss).
Magnes. ust., 40.0 (ʒ x).
Menthol, 2.0 (ʒ ss).
Glycerin., q. s.

To make a fluid paste.

## FILLING FOR DECIDUOUS TEETH.

DR. S. E. GILBERT.

Dental Cosmos.

In filling deciduous teeth it is often almost impossible to exclude moisture from the cavity sufficiently to permit filling with zinc phosphate, unless the rubber dam is used. The difficulty may be overcome in the following manner: Place some of the powder on a glass slab, also a little of the fluid, and beside these a little of chloro-stopping. Make a rather thin mix of the zinc phosphate, then add to this the chloro-stopping, mixing in more of the powder till a thin putty-like consistency is obtained; now napkin the mouth, and dry, immediately packing to place, and finishing with burnishers.

## FILLING CHILDREN'S TEETH.

Current literature reveals the fact that it is quite common to fill two approximal cavities, where they are extensive and the walls badly broken down, in children's molars, as one common cavity, extending the filling across and finishing it as one.

# MIXING CEMENTS.

MR. HALLIDAY.

Dental Record, June.

## OXYCHLORIDE OF ZINC.

To sufficient liquid add about an equal amount of powder. Work small portions of powder into a soft cream with a stiff spatula, gradually adding more powder till it is all mixed, carefully mixing each part smooth before adding more powder, until a decidedly putty-like consistence is obtained. It should not be kneaded. If used for lining the cavity, place in position with the point of the spatula and press into position with pellets of cotton-wool, taking care not to let the fibers of the wool be entangled in the mass as it is setting. It should be introduced in small portions.

## OXYSULPHATE OF ZINC.

Oxysulphate should be mixed to little more than a milky consistence, never thicker than ordinary cream when used for pulp capping. It should then be worked with the spatula until it begins to give the least perceptible evidence of thickening, when it should be taken on the end of a spatula and placed accurately in position by being pushed off by a moderately fine probe. It should not be worked after it ceases to flow under this instrumentation comparatively easily, or a very small pellet of cotton dipped in it directly it is mixed, and placed accurately in position, being readily secured in place by touching the edges with small smooth-ended instrument, or it may be taken up when just mixed on a spoon excavator, and if the convex part be placed next the pulp, the fluid will readily flow off the instrument wherever wanted. This takes five to fifteen minutes to set hard.

## PHOSPHATE OF ZINC.

A portion of fluid should be poured on the slab and more than sufficient powder poured out near it. A bulk of powder about equal to bulk of fluid should then be mixed with the fluid gradually but quickly. This should make the mixture of a thick creamy consistence, then a little more powder should be added and quickly and forcibly made into a mass by thorough working with spatula. The mass should be of putty-like consistence, though

some varieties are directed to be made stiff. The mass should then be scraped up on a spatula and taken from it by the thumb and forefinger. A good zinc phosphate requires considerable force to take it from spatula. It should then be kneaded, not rolled, by two or three gentle motions of thumb and forefinger. The warmth of the fingers makes the mass slightly more plastic, and kneading produces a more homogeneous mass. This should be now rolled into an oval and elongated form for filling. It should be introduced by round or flat-ended pluggers, the pressure to condense it being on the face of the material; if instruments be touched on an oil pad it will prevent the osteo sticking to them and so being liable to drag. Superfluous portions should be worked so as to overhang or be cut off by the margins of the cavity, so that they will break off sharp, leaving a clear edge to the filling at the cavity walls. This gives a harder surface to the filling than if cut down with emery discs.

## SINE MATRIX.

DR. W. R. SINE.

Items of Interest, January.

I have lately perfected a method and mechanical appliance that I look on as one of my most valuable assistants. This appliance transforms a former tiresome and arduous task into a mere pastime. Take, for illustration, the upper right central incisor mesial surface. The decay involves a considerable portion of the lingual wall; the labial wall is also broken. After adjusting the rubber dam, take a strip of copper about 30 gauge, almost as wide as the length of the mesial surface of the tooth, and one or one and a half inches long. After trimming one end oval, anneal it and insert between the affected tooth and the left central incisor, allowing the oval end to project beyond the lingual surface about a quarter of an inch, being governed by the extent of the broken wall it is designed to restore, making a liberal allowance for friable margins that will be cut away in the preparation of the cavity. Then bend the lingual end of the strip under the lingual surface of right central, and the labial end over the labial surface of left central. While holding firmly in place with the fingers of the left hand,

press on the labial end of strip, and burnish over the lingual end, easily and quickly obtaining a perfect adaptation to the lingual surface of tooth. The strip is then removed, ordinary care being observed to prevent a change in shape. After removing, the depression caused by burnishing is filled with silver solder. If an abundance of solder has been used, the result will be a matrix that has the combined advantages of solidity, stiffness, cheapness and accuracy. This can then be polished brightly on the surface against which the gold is to be packed, stiff brush wheels and pumice being first used, and then a soft brush with prepared chalk. The cavity is now prepared in the usual manner for filling, after which the matrix is readjusted and held firmly in position by a matrix clamp designed for this purpose, the clamp standing well out of the way, exposing the entire surface of tooth to be filled. After the filling is inserted, and clamp and matrix are removed, the lingual surface will be found highly polished. It rarely requires any further finishing.

## ELASTIC MATRIX—PLASTIC FILLING.

Journal British Dental Association.

Dr. A. A. Mathews stretches a piece of thin rubber tubing over the tooth to be operated upon, leaving it on for three hours after the tooth is filled, directing the patient to remove it. He uses different size tubing.

## CLENCY MATRIX.

DR. D. W. CLENCY, CINCINNATI, OHIO.

Dental Cosmos, March.

I feel constrained to offer or suggest a little device in the way of a matrix which is simple and effective, requiring but a few minutes to make and adjust. It may be modified to fit all approximal cavities in the molars and bicuspids.

For example, take the superior bicuspids. After dressing down the friable edges and excavating in part, adjust the dam and

finish the excavating. Take a strip of German silver plate of suitable width—the gauge may be determined by the space between the teeth, ordinarily about 29 or 30—polish and burnish, insert between, leaving the ends to stick out each side a trifle less than one-quarter of an inch beyond the teeth.

Scratch a line with an excavator across the strip on each side of tooth, being guided by the width of the tooth. Remove the strip, and with a suitable tool curl the ends back to the scratch, leaving the space in between the walls or shoulder so made just wide enough to engage the opposite tooth and hold the matrix from sliding laterally. Make the convex for contour of filling, with a clasp tool.

If a dip is required to reach down below the cervical border, cut away with a stub corundum in the engine; it may be also cut away on the top for light and space if the lower part of the cavity is obscure.

The rolls may be so bent that they will spring over the swell of the tooth, which keeps the matrix from working out while filling.

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## CELLULOID MATRIX.

DR. W. H. SHULTZ, ATCHISON, KANSAS.

Dr. Shultz says celluloid makes the very best matrix for cement filling; that the surface in contact with the matrix will be perfectly polished and finished when the matrix is removed. Thin sheets of celluloid can be had of photographers.

## THE MATRIX.

DISCUSSION BY THE AMERICAN ACADEMY OF DENTAL SCIENCE.

International Dental Journal, October.

Dr. Ainsworth.—To me the advantages in the use of the matrix in compound approximal fillings of bicuspids and molars is very great. To begin with, let me say that I am, as a rule, an uncom-

promising advocate of contour work. I am also firmly of the opinion that we cannot better preserve approximal surfaces than by using non-cohesive or soft gold at the cervical wall. To make such a filling entirely of soft gold, either with or without a matrix, seems to me impossible. By the use of the matrix I fill approximal cavities one-third or two-thirds full with soft gold, building out a proper contour, and then finish with cohesive gold. It seems to me that it would be impossible to work without a matrix and attain the same positive result. And then, if the matrix is properly formed and adjusted in place, the finishing of the filling becomes a simple matter. I have never been able to use the matrix to advantage with gold fillings in the front teeth.

Dr. Clapp.—An advantage of the matrix for gold fillings is this: it often saves cutting away tooth-substance in the process of shaping a cavity. For instance, in the case of an approximal cavity in a devitalized bicuspid, the cavity may be quite large, and at the cervical margin may be U-shaped. To start a filling with gold in such a cavity without a matrix is rather difficult. To facilitate this process the tooth is oftentimes cut squarely at the cervical portion, thereby reducing the tooth at its weakest point. These cavities can be filled with a matrix without this sacrifice of tooth-structure. I cannot conceive of a case where a properly adjusted matrix could be a disadvantage.

Dr. G. T. Baker.—I have used the matrix with a great deal of satisfaction, and have made it of various materials. A sheet of copper silvered on one side was the first material I ever used; also thin steel; and a piece of German silver, very thin. We have not yet been able to successfully solder aluminum, which stands to its disadvantage. I believe in making a matrix for each individual case; it can be done in a very short time, and is more satisfactory than using those we buy ready made. A strip of brass I use to a certain extent, which gives a great deal of satisfaction.

Dr. Allen.—I wish to bear testimony to the great value of the matrix in my work. I use it principally in plastic fillings of all kinds. Have had some unfavorable results from its use in filling cavities with gold, but attribute the want of success more to my lack of familiarity with the method than to the method itself. In using the matrix with gold fillings I have sometimes found them a little soft at the periphery; have been unable to thoroughly con-

dense the gold around the outer edge of the cavity at the beginning of the operation. To avoid this, lay the foundation of the filling, covering the edges of the enamel before applying the matrix, after which adjust it and complete the operation.

Dr. Ainsworth.—I am using a very thin cold-rolled steel, a steel that has a temper very similar to piano-wire. You can bend it to any desired position, and yet it has something of a springy nature. Form it as nearly as possible to the original contour of the tooth, and hold it in position by various methods. I often use the Perry separator, and then insert a piece of orange wood at the cervical wall, not too tightly, but just tight enough to bring the matrix towards the tooth. Beginning with soft gold, I can force the matrix away, not only at the cervical wall, but all the way up, so that when it is taken off I have a cavity which is uniformly too full. Two-thirds of the surface is made of cohesive gold. With proper burnishers I can burnish the filling very nearly to a finish, leaving only a trifle to be done by the disks and strips.

Shape the cavity with reference to filling it with a matrix, not having it too rounding, but very nearly on a plane, with just the feather-edge taken off; then pack two-thirds or three-quarters of the filling with hand pressure, beginning with cohesive foil when I have yet sufficient undercut to hold the filling. I do not know how extensively the matrix is used, but I feel that it is not adopted as it would be if all understood its advantages. I was for a time prejudiced against it, feeling that it would be impossible to pack gold properly in the places of which Dr. Allen speaks. And I thought that the finishing would consist more in working the tooth down to the filling than in working the filling down to the tooth, but this has not proved to be the case.

Another advantage in the matrix is that it enables us to restore the orignal shape of the tooth without previous separation. In the case of teeth which have never been filled or filed away, I do not care for separation obtained by the wearing of a wedge for two or three days or a week.

Dr. Meriam.—I think I am on record all I need to be as regards the materials to be used for matrices. I would speak again of the value of the optician's pliers, which give just the right curve for bending a matrix into position. Opticians use them for adjusting the spring of an eye-glass.

One of the great values of matrices is in Dr. Clapp's method of confining a softer material so that it can be built on advantageously with a hard one. It thus helps out in those places where it would otherwise be difficult to retain a hard filling. I use it for this purpose quite extensively.

It is useful in molars in filling with amalgam when the cavity involves the mesial and distal surfaces. A matrix can encircle the whole tooth and be left on until the amalgam hardens.

There is an advantage in breaking up your amalgam chips and either mixing them with the fresh amalgam or embedding them in it. There is less contraction in an amalgam filling which is built into a hole. A phosphate filling made with a matrix is a harder filling, and, consequently, less liable to solution than one made without such pressure.

I generally hold the matrix in place with a steel wedge, of which I have had several made. They are wedge-pointed, and just fit into my automatic plugger. After driving them in, a slight turn leaves them in position. I also use the ordinary pine wedge, which has, to a certain extent, the advantage which Dr. Ainsworth speaks of in the orange woods—that is, it is not too rigid. I whittle the pine out to a proper size and then compress it with a pair of pliers. After putting in the wedge a drop of water causes it to swell and hold the matrix firmly in place, though not so firmly that it will not give a little.

Dr. Clapp.—I find it absolutely impossible to get along without the matrix in combination fillings of amalgam and gold. One of the great advantages of the matrix is the help it gives in making contour fillings. I have felt conscience-stricken repeatedly on account of the time used in filling when I have heard men who are called rapid operators give their experience.

In teeth badly broken down by caries, the matrix is of great advantage. A tooth is decayed down to the alveolar margin, not only on the distal surface, but a little on each side—that is, both towards the palatal and labial surfaces. In such cases I adjust the matrix first and then put the rubber dam over it.

Dr. Meriam.—Having a distal cavity in a second molar, with the wisdom-tooth partly erupted, I made a matrix with an upper lip, which was bent backward, and formed a support for the rubber dam, which, without such help, could not have been adjusted. This

form of matrix changed a difficult operation into an easy one. You do not know how much cold-rolled steel can be forged without drawing the temper until you have tried it. You will find that you can make a knuckle by making a dent in the steel at the point desired.

Dr. Stevens.—There is one class of cavities that has not been mentioned in connection with the use of the matrix, and that is those shallow approximal cavities where the teeth are sometimes so sensitive that we cannot get undercuts to retain the filling. In such cases I oftentimes apply the matrix and fill in against it with amalgam, and then put soft cement between the amalgam and the wall of the cavity to insert the amalgam, and then finish with either gold or amalgam. In that way I get a filling that will stay without undercuts, and the work is very easily done.

Dr. Baker.—I sometimes make a matrix from a Parmly Brown polishing strip. The strip is bent about the tooth with pliers, and the ends soldered with soft solder.

Dr. Ainsworth.—I have had several cases lately of bicuspids that were very badly decayed, both upon the mesial and distal surfaces, so much so, in fact, that it was impossible to get sufficient retention to hold any filling excepting a cement. The pulps were alive, and enough of the buccal portion of the tooth remained to make a good appearance. In these cases I used a matrix made by passing a piece of German silver entirely around the tooth, drawing it together with the pliers, removing and soft soldering. With a burnisher I arranged the contour on either side, having previously separated the teeth. By this means I have been able to fill a large part of the cavities on either side with soft foil. By building the top of the filling with cohesive gold, the distal filling held the mesial, and vice versa. And the result was a finely shaped tooth, and one of great durability. This could not have been done without the aid of the matrix.

Dr. McKellops.—The matrix I think a very important instrument. In the first place, it gives plenty of room. I must have room to see what I am doing. I bevel the edges so that I know they will be perfect when I finish the plug. Take a matrix and fit it. If the neck of the tooth is a little too small, place on the jack-screws or Perry's separator to hold it in position. Get the rubber dam on first, and then put those in to hold the tooth firm,

and it gives no pain to the patient. If it is properly done the patient never feels the effect of the blow of the mallet.

In placing a matrix on, at the base of the gum it stands a little open. Something is wanted to hold the matrix to the wall. I am going to fill the anterior cavity. Take a piece of orange wood and bevel it the shape needed. Then a little varnish is added and it is forced in. That holds the matrix in place. I can spend two or three hours on the tooth without hurting the patient. It is a good thing when it is properly used, and the spaces are necessary.

One point that has not been alluded to is the use of the matrix that will come up one-fourth, one-third or one-half upon the cavity, as you choose. This forms the lower portion of the cavity, and it can be perfectly filled with ordinary care. After the upper part of the filling has been placed in position the matrix may be removed, and the remaining portion of the filling made without the matrix, care being taken, in building up along the lateral borders, to have it perfectly adapted and sufficiently flush or full to make a complete finish to the filling. In that way the difficulty that sometimes occurs in the use of the matrix when it extends to the grinding surface of the tooth, is avoided, and a good filling may be made, whereas if the full matrix were used the border would be more or less defective. In that way there is room for the entrance of the instrument, the file or disk, the corundum wheel, or whatever is used to finish off.

## TREATING MUMMIFIED PULPS.

DR. W. J. YOUNGER, SAN FRANCISCO.

Pacific Coast Dentist, August.

First sterilize the whole contents of the pulp chamber and canal with a solution of carbolic acid. Do not attempt extirpation until this is done. Plenty of time, too, should be taken for this, as it is very important. If necessary, employ two or three sittings at this task. Having thoroughly sterilized the tooth and its contents, proceed to break up the connection of the pulp at the apex, and take it out bodily as near as possible. If any symptoms of necrosis are pres-

ent, do away with all trouble by the use of lactic acid, which acts as a solvent of the sequestra. Sulphuric acid is entirely too strong to use in the treatment of teeth in this connection. After having rid the tooth of the offensive pulp, fill the canal with cotton saturated with a weak solution of carbolic acid and dismiss the patient for the time.

## FOR MUMMIFYING PULP REMAINS.

DR. T. B. WELCH.

Items of Interest, May.

One of the best combinations for the preparation of a root for filling, after removing the pulp to tan any remaining fibers, is tannin, made into a paste with equal parts of creosote and oil of cloves.

## THE RELIEF OF PAIN FROM DISEASES OF THE DENTAL PULP AND PERIDENTAL MEMBRANE.

DR. A. W. HARLAN, CHICAGO, ILL.

Dental Review, December.

The dental pulp is a frequent cause of pain after near or actual exposure of its surface to external agencies. When the pulp is exposed by accident the pain is easily relieved by protecting it from the air or moisture with chloral camphor, phenol camphor, oleate of cocaine, melted carbolic acid or other local anesthetic. The surface should be dried, if possible, before making the application. A mixture of collodion and carbolic acid, ten or twenty per cent., will serve as a temporary dressing. Twenty parts of carbolic acid, five parts of the hydrochlorate of cocaine and seventy-five parts of liquid vaseline will arrest pain from exposure of the pulp. I have frequently used twenty parts of a four per cent. solution of cocaine, thirty parts of pure oil of sassafras and fifty parts of melted carbolic acid as a local covering. This is only slightly caustic or escharotic. The bottle should be shaken before using when the mixture is fresh. The pain from a hyperæmic pulp is quickly relieved by puncture, when possible; if not, torsion will sometimes relieve the

pain. Remedies administered internally for retarding the circulation will seldom be effective in relieving the hyperæmic condition. Sometimes when torsion is practiced the addition of counter-irritation may relieve the pain. When the pulp of a tooth has been capped with any material before it is in a normal condition, there may be pain continuous or intermittent. Should this continue in spite of torsion or counter-irritation the filling must be removed. Even this will not always relieve the pain, and the pulp may have to be destroyed before the pain will cease. Of course it is understood that a pulp should not be capped when irritated or inflamed, but many pulps are capped in this condition, and the only salvation for them is to remove the capping.

The pain from a pulp where calcification of its substance is going on cannot be relieved permanently save by destruction of the organ. If the patient can endure the pain in course of time the pulp will be obliterated. Usually the patient will not endure such agony for very long, and unless relief is afforded the tooth will be extracted by some other dentist.

The pain from congestion of the pulp and the formation of pus in its substance can only be relieved by getting direct access to it and pricking it to relieve the overfull vessels. After the tension has been relieved the pain does not always cease. It has been a favorite method with me to wash the cavity with peroxide of hydrogen at once and quickly dry the cavity; apply pure chloroform on cotton, then melted carbolic acid. In five or ten minutes the patient will be comfortable. It is my theory to destroy the pulp if there is no probability of saving it. I might attempt to coax it back to health if it were an exposed front tooth in a young person's mouth. There are few cases where it is possible to retain the vitality of a pulp after suppuration of a small portion of its substance. The mere puncturing of a pulp with a sharp-pointed instrument to relieve congestion or hyperæmia is not always sufficient reason for the destruction of a pulp unless the vital powers are low or the patient is past fifty years of age; then the recuperative forces may not be sufficient to enable it to live under a capping. Drying the surface of a suddenly exposed pulp and painting it with collodion will arrest pain. When the pulp is dead and the pain results from pressure of pus beyond the apex, the manifest duty of the surgeon is to give it exit through the root canal, or by drilling into the

alveolus through the process. If a simple pericementitis has to be dealt with, calcium sulphide, 1–10 gr. pill every ten minutes until six have been taken, will ordinarily arrest pain. Prior to this an aperient may be administered. Citrate of magnesia, a Seidlitz powder, hunyadi janos, or some other internal remedy. Counter-irritation, tincture of capsicum, cantharides, ammonia, chloroform, absolute alcohol or a metal disc of the size and thickness of a copper cent, dropped into boiling water before using it. When there is a pocket alongside the root wash with pyrozone, then inject into the pocket two or three drops of vinum opii or a twenty per cent. solution of menthol in alcohol, or ten per cent. acid carbolic in liquid vaseline. Bathe the face in hot water, place towels or napkins on the face after dipping them in hot water 140° F. Keep changing them and relief will come. When the pulp is exposed at the apex destroy it.

## PAPOID FOR DESTROYING REMNANTS OF PULPS.

Dr. Howe and others speak favorably of papoid, a preparation made by Johnson & Johnson, of New York, for the purpose of digesting the remnants of tooth pulps.

## PAINLESS REMOVAL OF THE PULP.

It is claimed by several writers that the pulp can be painlessly removed by applying a drop of carbolic acid to it and working in the instrument; the acid by its escharotic action relieves the pain.

## TREATMENT OF PUTRESCENT PULPS.

DR. ARTHUR L. SWIFT, NEW YORK.

International Dental Journal, March.

I have long since discarded the use in pulp canals of coagulants, such as carbolic acid, creosote, etc., upon the theory that the coagulum dams up the tubuli and thus prevents diffused medication

and thorough disinfection, and instead employ the diffusible essential oils, such as eucalyptus, eugenol, oil of cassia, myrtol, etc., which are very diffusible, carrying large quantities of oxygen and depositing volatile camphors, which are all-powerful in the destruction of septic and infectious matter.

Oxygen stored up in the tubuli aids by its bleaching qualities in retaining the natural color of the tooth, and the non-irritating effects of these oils, with their gentle stimulating action, marked diffusibility and powerful disinfectant properties, make them especially valuable in these putrescent and inflamed conditions.

In this age of antiseptic surgery, it behooves us to use every possible aseptic precaution; consequently, care should always be taken from first to last to exclude all saliva, and no instruments should be used which have not been thoroughly sterilized. Having gained free access to the pulp-chamber, wipe out the cavity with cotton saturated with equal parts of peroxide of hydrogen and bichloride of mercury, 1 to 1000, and carefully remove the contents of the canal so as to avoid penetrating the apex, or forcing any septic matter through it; then wipe out the canal with cotton on a broach, saturated with peroxide of hydrogen and bichloride solution, and dry thoroughly with bibulous paper or cotton, followed by use of hot air, and pump into the canal oil of cassia, eugenol, or myrtol, and insert very loosely a whisp of cotton or floss silk saturated with oil of cassia, and seal with gutta-percha, perforating the filling, and if periosteal inflammation exists, paint the gums with saturated tincture of aconite and iodine, and dismiss the case for three or four days. When next seen remove the dressing and pump eucalyptol or myrtol freely into the canal with cotton on a broach, and follow with a dressing of cotton or silk saturated with eucalyptol packed tightly and sealed with gutta-percha without perforation, and dismiss for about ten days. When next seen the canal will be in good condition for filling. Then treat as when last seen, pumping eucalyptol or myrtol, or equal parts of both, into the canal; and after thoroughly drying fill the canal with oxychloride or chloro-percha.

In case of blind abscess, drain the abscess thoroughly by frequent wipings of peroxide of hydrogen and bichloride solution, and inject without pressure oil of cassia, or equal parts of cassia and eucalyptol, and insert a whisp of cotton saturated with the above very

loosely, not closing apex, and seal with gutta-percha and perforate, painting gums with tincture of aconite and iodine. Examine it again in about four days and treat as before, packing dressing, saturated with eucalyptol or myrtol, and seal tightly; and if after ten days tooth is not sore to percussion, fill the canal. If, after having opened into the canal, pain and inflammation continue for some time without abatement, I have found it successful to open into the apical space with a small trephine, which causes very little pain with the use of local anesthetics, and treat with peroxide and bichloride solution, injecting eucalyptol, or myrtol, placing a tent of cotton moistened with oil of cassia in the opening, and treating the canal as before.

In case of abscess with fistula, syringe through it, and inject oil of cassia or eugenol through the canal until it comes out at the opening; dress as before with cassia or eugenol, putting a tent of cotton in the fistula saturated with cassia and seal with Fowler's stopping or gutta-percha and perforate. Examine it in two days; treat the canal as before, and pack tightly a dressing of eucalyptol or myrtol; seal without perforation. Examine further in two days, and then pump eucalyptol into the canal; dry and fill the canal, and treat the fistula with cassia, and examine it occasionally until healed.

If, after filling roots in any of the conditions described, trouble should subsequently occur, which has not been the case in the writer's practice during the period of about six years, a trephine should be used, opening into apical space, and treating through the opening, upon the theory that the tooth having been thoroughly disinfected and filled, the trouble must be simply an apical pericementitis, caused by some septic matter having found its way beyond the apex, and by gaining direct access to the apical space the cause of trouble may be removed.

## DEVITALIZING PULPS

DR. BOYCE.

International Dental Journal, November.

The writer says he never applies arsenic to a congested or irritated pulp, but controls this condition with morphine locally applied, until the pulp can be pricked, painlessly almost, with a fine instrument, on which he has placed the arsenic.

It is certainly an excellent practice to make for each application a fresh supply of arsenic, morphine and oil of cloves. Work them together with a spatula on a slab. An inflamed pulp can often be devitalized painlessly this way. Use a very small quantity applied directly to the pulp and cover with wax melted in with a hot instrument.

Dr. C. N. Pierce says if an application of tannin or carbolic acid and morphine is applied to the pulp and left there for twenty-four or forty-eight hours, that the arsenic can be applied without producing pain and be effective in its work. His idea is that the pulp in an inflamed condition will not absorb but rather throws off. Hence his suggestion for correction of this condition.

## TREATING FOUL PULP CANALS.

DR. W. H. JACKSON, ANN ARBOR, MICH.

Dr. Jackson says he finds the following dressing very valuable in treating foul pulp canals with soreness at end of root:

Menthol pip. crystal,
Chloral hydrate, equal parts.

It is somewhat antiseptic, is soothing, agreeable to taste and smell.

He says also that chloral hydrate is a solvent for camphor, which makes a solution of value to dentists.

## DESTROYING PULPS WITH ARSENIC.

DR. LEROY REQUA.

Dental Cosmos, December.

Suppose a case of exposure in a molar, with a large crown cavity. The frail and overhanging edges are trimmed and cut back, so that a good view can be obtained of the pulp, or the place where it ought to be.

With a large spoon-excavator the carious matter is removed as far as possible, without cutting into the chamber. If there is a tough, leathery skin surrounding and partially covering the pulp,

it is left intact. The cavity is then bathed with oil of cinnamon, and the pulp is ready for death.

Next, from a piece of good tough spunk is cut a thin disk that will cover about one-half of the floor of the cavity. This is moistened with carbolic acid, and the smallest possible quantity of Squibb's arsenious acid is worked or pricked into one side of the spunk. This is then placed, death side down, on a glass slab, and dried with bibulous paper.

The cavity is made ready in the usual way, and the disk of spunk applied directly to the pulp. The cavity is then dried with hot air and sealed with gutta-percha. In sealing, a small piece of gutta-percha is warmed in the flame and mashed thin between the thumb and finger. This is placed on a curved spatula and drawn across the cavity, thoroughly sealing it without pressure. A pledget of cotton is sometimes placed in the bottom of the cavity before sealing, to prevent pressure.

In approximal cavities, where the cervical wall is below the margins of the gums, the gutta-percha is pushed down against it with a thin bent spatula after the cavity is sealed. This prevents all danger of leakage and death to surrounding tissues.

The point I wish to impress is this: The arsenic being worked into the little disk of spunk does not give the exciting effect or shock to the sensory nerves that it would were it placed there in a mass, full strength. The absorption takes place more gradually, and before much pain is felt paralysis begins, and by this time the full power of the drug is at work.

Experience has taught me that twenty-four hours is quite long enough to leave an application of arsenic in a tooth. Then the pulp can be extirpated before the stage of paralysis has passed off. In the majority of cases, when the arsenic has been left for two or more days, a soreness of the tooth is complained of, and a marked congestion of the peridental membrane will be found.

In the anterior teeth, where conditions were favorable, I have had the best success from applying arsenic in the morning and cleaning out the canal and filling in the afternoon. Another point which I wish to mention is the generally accepted theory that an inflamed and aching pulp will not take kindly to arsenic. My experience has led me to believe that this is something of a fallacy. I have repeatedly had exposures of long standing, when the pulp was

blue with congestion and had given pain for days, succumb in twenty-four hours after the treatment by this method. We have all too often heard the same tale of woe, sleepless nights and hours of pain and suffering following the application of arsenic.

## CAPPING PULPS.

DR. F. H. GARDINER, CHICAGO.

Dental Review, August.

The safest method of destroying the pulp of a temporary tooth is to first cap it with oxychloride of zinc. The necessity for capping the pulp of a temporary tooth exists only when a portion of the crown has been destroyed prior to the fourth or fifth year; the resorption of the root of a deciduous tooth not usually beginning until a later period.

I shall have nothing to say concerning the preliminary treatment of the pulp of the tooth, presuming that before capping is attempted the pulp will be in a normal or at least a healthy condition.

The pulps of adults teeth should be capped, or efforts to save the pulps should be made in all oral teeth, those exposed to view, no matter at what age they may become exposed. The pulps of teeth that are exposed posterior to the second bicuspids, if any doubt exists as to their being saved by capping, should be destroyed at once. This applies to nearly all ages above the seventeenth or eighteenth year.

After application of the rubber dam, perfect dryness of the cavity and surface should be obtained. Over the surface of the pulp a thin film of Canada balsam should be placed, or a film of copal ether varnish. After the evaporation of moisture has taken place, a very thin paste of oxysulphate of zinc should be gently manipulated over and beyond the point or points exposed. When this is sufficiently hardened, a portion of the surplus may be trimmed away and the whole cavity filled with oxyphosphate of zinc. This must be allowed to harden for a period of not less than thirty minutes. When the patient is ready to leave the office and before the rubber dam is removed, the surface of the filling should

be painted with a solution of copal ether varnish. The use of a blast of hot or cold air will cause this to become rapidly dry.

Care must be taken in all such cases to avoid filling the cavity too full, so as to produce no pressure on the pulp in mastication, or when the teeth come together, after wedging, in case it should be a proximal cavity.

## TREATMENT OF NEARLY EXPOSED PULPS.

DR. C. F. IVES, NEW YORK.

International Dental Journal, July.

By nearly exposed pulps the author means where a fair amount of sound dentine intervenes and the operator is in dangerous proximity to the pulp. He says that in comparatively painless excavations, with the feeling of sound bone under the bur or excavator, we are very apt to take chances perhaps not warranted, forgetting that one thing a pulp will not submit to is pressure, and we are often a trifle nearer the dividing line than we are aware of. Here is his point. You cannot place directly over a nearly exposed pulp as a non-conductor either gutta-percha in bulk or solution, oxyphosphate, oxide of zinc with carbolized gum-water, or any compound that will harden, without producing pressure from expansion or contraction. It may be slight, but slight as it is, it often results in the death of the pulp. Gutta-percha, tissue-cork, quill, or whatever may be your favorite capping, if lying directly on the floor of the cavity and covered with other material which requires even light packing, will often prove fatal to the nearly exposed pulp.

I endeavor to avoid all pressure. A piece of very thin aluminum—this because of its purity and lightness—a bit of hard wood, apple-seed or shot-head burnishers, and in a moment a concave cap is prepared to fit the case; this dipped in varnish; the cavity bathed with oil of cinnamon, not oil of cassia, which is the Chinese product, but the Ceylon oil, which you will know because it will cost you two dollars an ounce, for which I have discarded all other antiseptics in cavities, because it is safe, effective and pleasant. The cap, always large enough to rest outside the line of the cham-

ber, is covered with a layer of "Fletcher's Nerve Capping." If you do not use it, let me urge you to try it. For thirteen years it has proven in my hands an efficient aid in all such cases. It is an oxysulphate of zinc, non-escharotic, and hardens sufficiently in three or four minutes to pack any material upon. It is a beautiful temporary filling, wonderfully nice for cavity lining, and, in combination with any good antiseptic, an excellent root filling. I always cover the application of arsenical paste with this cap and Fletcher's material, avoiding all pressure. Dr. Miller, of Berlin, has recently spoken very enthusiastically of it.

## FILLING ROOTS WITH CHLORO-PERCHA.

DR. R. I BLAKEMAN, NEW YORK.

International Dental Journal, April.

When the fluid is very thin, it seems as susceptible to capillary attraction as water. Therefore, as some of the canals we wish to fill are very fine, and we feel that they must be filled, as upon this largely depends the future welfare of the tooth, to fill them with this solution seems practical, so far as the principles of physics are concerned. For the purpose of describing the process of manipulation, let us consider a molar, the roots of which must be filled from a posterior cavity difficult of access, a somewhat common occurrence. When the roots are dry and ready to fill, it is best to add some fresh chloroform to the solution kept on hand, so that the upper portion is quite thin, while the lower is left very thick. Then with a small broach, with a few fibers of cotton wrapped about the end, the solution can be carried to the canals, and, when the entrance to them is flooded over, it can be pumped in with a small bare broach.

After the canals are full of the thin solution, by dipping deeper into the supply the thicker gutta-percha is obtained, which can be pumped into the canals in like manner, the chloroform being worked out so that it can be evaporated with a chip blower. If there should be a doubt as to the fluid having gone to the apex of any canal, it can be pushed farther by making a piston of warm gutta-percha. But great care should be taken in doing this, and the patient should be instructed to respond to the first sensation, for

sufficient force may be brought to bear unconsciously to push the fluid through the foramen. When the canals are sufficiently large to permit of it, it is best to put in a gutta-percha point after they are full of the solution, but not so tight as to cause pressure at the end of the root. It might be well to emphasize this point, as any one not accustomed to filling roots in this way is very liable to force something through the apical foramen, which we all know the importance of avoiding in roots that have never had fistulous openings. My personal experience in following out this method is that I am more apt to do too much than not enough, and, after experiencing the results of going too far in some cases, find it easier to stop in time.

## ROOT DRESSING.

DR. W. E. BLAKENEY.

Items of Interest, January.

An excellent root canal dressing may be made by rubbing up a grain of aristol in ten or twelve drops of one of the essential oils, to which may be added two or three drops of ether or chloroform to facilitate the process.

## ASBESTOS FIBER IN ROOT CANAL TREATMENT.

DR. E. C. KIRK, PHILADELPHIA.

Dental Cosmos, January.

The use of liquid or semi-fluid substances for root-canal dressings or fillings is rendered extremely difficult in the superior teeth without the assistance of some fibrous material which acts as a carrier or vehicle to overcome the effect of gravitation, and so secure the placing of the dressing fully to the apex. Cotton wool, silk or lamb's wool, and in fact all of the fibers used in this connection, present the uniform objection of inviting the absorption of secretions through their porosity, and by reason of their organic origin, of developing a tendency to putrefactive changes with resulting irritating effects on the pericemental membrane. For the

past two years I have used, with much satisfaction for the purpose under consideration, a long fiber Canadian asbestos, which is to be had from the dealers in asbestos materials. It should be obtained in its native condition as rock asbestos, not separated into the fine woolly condition by the mechanical processes used in preparing it for commercial purposes. The best variety occurs in irregular masses, deep emerald green in color, with a fine striated structure in which the fibers are in bundles from one-half to two inches in length. For use in pulp canals the fiber is readily obtained from such a mass by holding it in the left hand and rubbing off a sufficient quantity in a fine silky condition by using the ball of the right thumb applied at right angles to the length of the fibrous mass. By rubbing it in this manner for a short time a flock of extremely fine fiber will be obtained, which can be twisted into a suitable wisp, having great tensile strength and a certain rigidity which enables one to readily carry it, even when moistened with a medicament, to the apex of the canal. The material described has certain marked advantages over any other fibrous material in common use for the purpose—viz: it is inorganic and undecomposable by any of the substances ordinarily used for pulp canal treatment; it is unaffected by the ferment agents there present; it is, by reason of its non-combustible character, readily and instantly sterilized by passing it through an alcohol flame and heating it to redness; it makes a suitable and unalterable vehicle for the application of tincture of iodine, potassium permanganate, nitrate of silver, sulphuric acid, or any of the agents which disintegrate cotton or wool fiber, as these are prone to do when used in concentrated solution. Further, it makes a most excellent vehicle in connection with oxychloride of zinc, chloro-percha, or paraffine as a permanent and unalterable root filling material.

## FILLING ROOT CANALS.

DR. J. L. WILLIAMS, BOSTON.

Dental Cosmos, October.

His practice is to take rods of lead, zinc, tin or copper, and having shaped them to fit the cavity, imbed them in a mixture of tincture of benzoin with oxide of zinc. This paste will make a

tight, permanent filling. He allows the end of the rod to extend into the pulp chamber, and turns it over after it is set in the canal, and fills over it with gutta-percha. In case of necessity it is easy to remove the gutta-percha, and then get hold of the end of the rod and draw it out of the canal.

## TREATING AND FILLING ROOT CANALS.

DR. FRANK ABBOTT, NEW YORK.

Dental Cosmos, September.

In treating pulpless teeth, the author says he treats them all in one general way. That way is to open the pulp chamber carefully, so that it may be cleansed thoroughly of every particle and get thoroughly into all the root canals. Then, with a very fine gold-pointed syringe, use a 1 in 10,000 solution of bichloride of mercury—a grain of bichloride of mercury in twenty ounces of water—and syringe out these canals thoroughly. Then, with a broach or small instrument, penetrate into the canals as far as can go, stir up the contents, and then wash again, repeating this until sure that eveything is clean, so that the substance coming out of the tooth as it strikes a white napkin will show a white, clean color instead of staining, as when the canal is filled with dead material. When it is washed thoroughly clean, fill with oxychloride of zinc, in which put a drop of a solution of 1 in 2,000 of bichloride of mercury, thus combining the antiseptic properties of the bichloride of mercury and the penetrating and antiseptic properties of the chloride of zinc and oxide of zinc.

This is the material that mummifies or holds this substance that is left in the roots of the teeth, leaving it in a condition to give no trouble; and it may astonish some of you to know that instead of opening a tooth and treating it day after day for a week or more, I open a tooth and fill it at the same sitting always, unless there is periosteal irritation—soreness of the tooth to touch. The crown of the tooth is filled with gold or any substance selected to use, of course, and dismiss the patient after painting the gums carefully over with a solution of concentrated tincture of aconite root and tincture of iodine. This always do before the patient

leaves the chair. It is a powerful counter-irritant, and does the work of relieving the pressure around the root of the tooth. This, to me, is the simplest, easiest, and most quiet way of getting along with that kind of teeth.

## FILLING APEX OF ROOT WITH METALLIC FIBER.

DR. W. H. RICHARDS, KNOXVILLE, TENN.

Dental Cosmos, September.

He having cleaned out the root canal as well as possible, moistens a broach with oil of cassia and passes it into the canal to moisten the walls, then, with the broach moistened, he touches it to the metallic fiber, which adheres to it. Now, inserting the broach with the adhering particles of the fiber into the canal, he manipulates it so as to work the fibers down into the canal, the sense of touch assisting him in determining when the apical foramen is reached.

## TREATMENT OF INFECTED ROOT CANALS WITH KALIUM AND NATRIUM.

DR. E. SCHREIER, VIENNA, AUSTRIA.

Dental Cosmos, September.

The author mixes about two parts of sodium to one of potassium, prepared in such a manner that it will adhere to a nerve broach. It is put into a vial and covered with a paraffine stopper. To use it, the broach is thrust through the stopper and withdrawn with a coating of the preparation on it; this is carefully introduced into the canal. These chemicals having great affinity for water, heat is generated, potassium and sodium hydroxides are formed, which combine with the "fat" of the pulp and form soap. This is easily washed out with warm water. This is a dangerous preparation and should be used with great care. If a large quantity is used, there is danger of an explosion. It should be carefully kept off the skin.

The author says he treats pulps immediately after their de-

struction, if there is no sensitiveness, and says there is no soreness after using it. He also treats fistulous and non-fistulous abscesses the same way, all with good results.

He asserts that by this method a dead and putrescent pulp may be removed and the root and tooth filled at once with absolute safety.

## ROOT FILLING.

DR. R. T. OLIVER.

Fill the root with chloroform from a syringe, dip the gutta-percha point in the same and force it into the root.

## FILLING ROOTS.

DR. W. C. BARRETT, BUFFALO, N. Y.

Dental Practitioner and Advertiser, January.

The best indication that a tooth-root is in a proper condition to be filled may be found in its dryness. As long as it cannot be made perfectly dry, it is in no state to fill. The rubber dam, of course, should be in position when the time comes. Then thrust a delicate smooth broach as far into the root as possible, and immediately wipe it upon the rubber dam. If there is any moisture it can plainly be seen, and if this cannot be perfectly removed further treatment is demanded, both because the root is not fit to fill, and because it will be impossible to carry any filling material to the end of the canal. When pumping chloro-percha into a canal the distance to which it has penetrated may be told by a look at the broach. If it is clean for any distance from the point, the filling material has not penetrated beyond that place. The ordinary chip-blower, filled with hot air from above the apex of an alcohol or gas flame, makes the best root or cavity drier.

## CHARRED COTTON FOR ROOT FILLING.

Correspondenz Blatt für Zahnarzte.

Kohlenwatte (charred cotton) is recommended as an antiseptic, absorbent, non-irritating and insoluble preparation for filling root canals, capping pulps, etc.

## GUTTA-PERCHA AS A ROOT FILLING.

DR. S. FREEMAN, NEW YORK.

International Dental Journal, September.

After thoroughly treating and drying the root canal, take a Dunn's syringe with a platina point, and inject a drop or two of a saturated solution of hydronaphthol and chloroform in the root-canal. Then take a gutta-percha cone, place it in the canal as near the apex as possible, where it dissolves; in other words make the chloro-percha in the root, then follow this with one cone after another until the canal is entirely filled. He has employed this method for a number of years, first using iodoform and chloroform instead of hydronaphthol and chloroform.

## INTERARTICULATION AND OBSCURE PAINS ABOUT THE MOUTH AND JAWS.

DR. L. VAN ORDEN, SAN FRANCISCO, CAL.

International Dental Journal, October.

In a paper before the Columbian Dental Congress, the author cites many cases showing mal-articulation to be the cause of severe pains of difficult diagnosis.

The main benefit that the writer has derived from the observation of these and other cases has been the conviction that the extraction of one or more teeth, especially of the inferior first molars, is liable sooner or later to lead to discomfort in some of the remaining teeth, and that such discomfort may, with patience, be located and relieved by the use of an engine stone.

## APPLYING NITRATE OF SILVER IN CARIOUS TEETH.

DR. A. M. HOLMES.

International Dental Journal, May.

The cavity being dried, a piece of gutta-percha is warmed and touched to some powdered crystals of the salt, then packed into

the cavity, thus holding the caustic in contact with the surface to be acted on. This the writer has found to be a very simple and effective way of securing the desired result.

## BLEACHING TEETH WITH PYROZONE.

Dental Cosmos, November.

Dr. Meeker says with a gold probe, on which is a twist of bibulous paper, introduce caustic pyrozone into the cavity of the tooth and throw on it a blast of air to hasten evaporation. The process is continued until the desired whiteness in the tooth is obtained. Have the dam on.

## SEPARATING TEETH.

DR. G. E. GREENE, SOUTH GARDNER, MASS.

The writer takes a strip of bibulous paper and folds into a ribbon, which he forces into the cavity, between the teeth, and moistens it with sandarac varnish. He says this enables him to fill the teeth the next day.

## COCAINE FOR REMOVING NERVES.

DR. ROSE

Has often performed operations in this way that surprised him. By rubbing small portions of the cocaine in a mortar or on a glass, with a single drop of carbolic acid, and touching the exposed nerve with what can be carried of this solution on a nerve broach, he has extracted the nerve painlessly.

DR. HEWETT.

Nerves can be extracted painlessly that way if the dentist will use care and a little time. I have done it repeatedly by making a paste of cocaine and glycerine. Use the glycerine in preference to carbolic acid.

## CASES CONTRAINDICATING COCAINE.

DR. PRUYN

Says there are cases in which it would be unwise to use cocaine; for instance, in a case of known pregnancy, or where there is any known pulmonary trouble, or where there is a diseased condition of the kidneys, because cocaine has a very marked effect on the kidneys.

He finds by experience the best results attend its use after the patient has had a full meal; has found the toxic effects much more marked when used upon an empty stomach. To use it in a case to any considerable extent first fortify the patient by the use of morphia.

## EROSION, MAGNESIUM HYDRATE FOR.

DR. E. C. KIRK, PHILADELPHIA.

Dental Cosmos, July.

A method for locally counteracting the injurious action of acid secretions, especially in erosion cases, and which has given him greater satisfaction than any means which he has employed, is by the use of a preparation known to the drug trade as Phillip's Milk of Magnesia, which consists of precipitated magnesium hydrate held in suspension in water. It is to be applied in the same way that lime-water or precipitated chalk is used for the purpose of bringing about an alkaline condition of the oral fluids, by neutralizing the excess of acids present. A teaspoonful of the preparation taken into the mouth and allowed to float around over the teeth coats them with a slight film of alkaline magnesium hydrate, which is sufficiently adherent to protect the tooth-surfaces from the acid action for a number of hours. He has tested the reaction of the saliva three hours subsequent to the application, and found it still markedly alkaline. It is probably sufficient to prescribe its use three times daily, after meals, though when used night and morning the action is markedly beneficial in retarding erosion. Its advantage over soda bicarb., chalk or lime-water is because of its continued action over a considerable time and the film-like alkaline coating which it forms upon the surfaces of the teeth.

## TEMPORARY STOPPING.

Cotton saturated with chloro-percha makes a convenient and quickly inserted temporary stopping.

## TREATMENT OF DEVITALIZED TEETH BY ELECTROLYSIS.

MR. POINSOT.

Odontologie, August.

In cases of devitalized teeth which have been carefully treated and roots apparently thoroughly disinfected, and which, after being repeatedly filled temporarily, give origin to pain, electrolysis will give favorable results. It is to be applied as follows: A piece of moist cotton is placed on the labial portion of the maxillary on which the negative pole is applied, while the platinum point of the positive pole is introduced into the dental canal. At first a current of two milliampères is kept up for three minutes, then elevated to three, four and finally five milliampères, the whole time occupying eight minutes.

## OPERATIVE AND THERAPEUTIC TREATMENT OF TEETH IN WHICH THE PULP CHAMBER IS PENETRATED.

DR. EDMUND NOYES, CHICAGO.

Dental Review, April.

When a tooth is before us for treatment in which the pulp is still alive, but has been more or less injuriously affected by the action of external agents upon it, the question of its preservation or destruction is at once presented for determination, and so many circumstances, difficulties, dangers and probabilities must be considered and given their proportionate importance in relation to it that the decision is not always easy, and in many instances at least, it cannot be expected that there will be entire agreement among all good practitioners.

The general grounds upon which an opinion should rest may be briefly stated, and every one must weigh and measure them for himself in their application to individual cases.

Pulps which have not been quite uncovered, but have become somewhat irritated and perhaps occasionally painful, from the effects of thermal changes or the irritations caused by the contents of the carious cavity, conveyed through a thin layer of dentine, whether sound or considerably softened by decalcification, may almost always be saved. There may be a combination of adverse circumstances that will occasionally justify the extirpation of even such pulps as these, as for instance, if the decay is such that there must be a very large mass of filling in close proximity to it, and a cavity so situated or shaped as to make it impossible to interpose any appreciable amount of non-conducting material, especially if there be added to this an unfavorable constitution or condition of health, with such age that the pulp is no longer of very great value to the tooth. There may be a few instances in which extreme difficulty to find secure anchorage for a filling may be allowed to have some influence upon the decision whether to save or destroy. It may be inferred by some that if any of the pulps just described, which have not been wounded and are in comparatively favorable condition, may be destroyed with propriety, then all those which are actually exposed, or have become more seriously irritated or inflamed, should be extirpated without hesitation; but this is far from being the case.

Age is the most important consideration relative to the necessity of the pulp to the welfare of the tooth. We occasionally find a pulp exposed so soon after the eruption of the tooth that the root is not fully developed and the opening through which the pulp vessels enter too large to be called a foramen, being still the full size of the pulp canal. If such a pulp be removed the opportunity for complete structural development is forever lost, both as respects the unformed end of the root, and the proper completion of the calcification of the dentine. Of course in such cases every possible effort should be made to save the pulp and even desperate chances may be taken if there is a fair opportunity to watch the cases; the loss of such pulps being usually followed by the loss of the teeth, either immediately or in a few years. Pulps which have been previously free from pain and are freshly exposed by an aseptic instrument may almost always be saved if carefully treated, and there is

a fair opportunity to give them suitable protection against the force of the operation and from thermal changes afterward, but if no care has been taken to disinfect the carious cavity, and the instrument happens to plunge somewhat into the substance of the pulp instead of merely scratching the surface, the probability is that it will suppurate or die from the effects of inflammation, because it will not be practicable to certainly follow with disinfectants so deeply as the infection may have been carried by the instrument. A large proportion of such exposures may therefore be wisely followed by an application of arsenic.

If exposure of the pulp is complete, of considerable extent and of such duration as to cause chronic irritation, the cases are very few indeed in which the attempt for its preservation is worth while. I can think now of but two cases, those of teeth so young that the life of the pulp is essential to the preservation of the tooth for any considerable time, and those in which the cavity of decay is so situated that no use can be made of it as a channel through which to extirpate the pulp and fill the roots. Either of these cases will sometimes justify taking desperate chances.

An important reason against the preservation of doubtful pulps, except when especially desirable on other grounds, is their observed intolerance of large masses of metal in close proximity. This manifests itself sometimes by their death (perhaps very soon, or, perhaps, only after a number of years), sometimes by neuralgic pains, more or less severe, and of longer or shorter continuance, and occasionally, especially if there are a number of large fillings near together, quite impossible to locate with certainty until disease or death proceeds far enough to cause some peridental irritation. Sometimes it appears to be the cause of the formation of pulp stones.

The comparative certainty of results and immunity from subsequent trouble that usually attends the extirpation of pulps and filling of root canals if the operations are made with intelligence, skill and patience, has operated very powerfully in late years to discourage the attempt to save alive, diseased or doubtful pulps.

The discussion of pulp capping used to be carried on as if it were about all included in the problem of treating the pulp and making the operation in such a way that death would not follow at once, or very soon. The fact is that a great many cases in which the pulp lives long enough in apparent health to show that

the operation of capping was perfectly successful, either die afterward or give rise to so much neuralgic pain, often difficult or impossible to locate, as to leave no reasonable question that extirpation would have been better in the first place.

It will be inferred that the writer goes a long way toward a belief in the aphorism, "A pulp that has ached deserves to be killed," but the exceptions are rather numerous and some of them very important.

Not very much need be said about the procedures in capping pulps, they have been so often and sometimes so well described. If there has been actual exposure, and often if there has not, it is necessary to treat the exposed pulp or the cavity of decay antiseptically before the operation, and time is an essential element in this treatment. Mild, diffusible, non-escharotic and non-coagulating agents should be used, and unless everything softened has been removed from the cavity, and the exposure is freshly made by the instrument and a mere scratch upon the surface, and there is no history of previous pain, the antiseptic should be closed in by a tight temporary filling and left for some days. This affords the necessary probation to see what disturbances may arise in the pulp, and gives time for the antiseptic or disinfectant to penetrate the entire territory involved. Oil of cloves, eugenol, eucalypti extract, and, perhaps, a rather large number of other things will answer the purpose. Oil of cassia or cinnamon is very irritating and should be used with more caution, but may sometimes be useful. Carbolic acid and the whole list of powerful escharotics and coagulants should be kept out of these places and, for the most part, out of pulp chambers and root canals generally. The capping may be done in many of the ways often described, but equally well by warming a flattened pellet of Hill's stopping (the tougher forms of gutta-percha are not so good), touching one surface with eucalypti extract and gently laying it over the exposure, fitting it down upon the floor of the cavity with very gentle pressure. This should be covered with phosphate to make a hard cap to protect the pulp from the force of the subsequent operation.

I will not attempt an orderly and complete presentation of the subject of the extirpation of pulps and root fillings, for that would make this paper much too long, but will briefly refer to

principles and methods of procedure, to some of the difficulties to be encountered and some of the lessons of clinical experience.

Of course arsenic in some form is the agent of devitalization, and I have found most satisfaction with some one of the formulas containing cocaine. The essentials to insure freedom from pain after the application, appear to be absence or reduction of acute inflammation, or somewhat free bleeding, and avoidance of pressure upon the surface of the pulp. The latter is not always perfectly easy, for it is still more important to have arsenic tightly sealed in the cavity so that it cannot escape upon the gum than to have the patient free from subsequent pain. It can usually be done with some of the softer forms of gutta-percha compounds, by using sufficient care, and there are many cases in which a slight amount of pressure will not cause pain, either at the time or subsequently.

I will not speculate upon the action of arsenic. I know nothing about it except that it will kill the portion of pulp in contact with it, and will usually kill the whole pulp. The arsenic should be removed in one or two days, chiefly on account of the danger that the temporary stopping over it may happen to leak or become displaced, and the possibility of that should be entirely removed as soon as the arsenic has done its work. Theoretically I can see no reason why the action of the arsenic should not sometimes extend beyond the foramen, but clinically I have never seen a case in which I felt sure that peridental irritation was caused by arsenic, and there are so many other possible causes for such irritations that I am very slow to believe it due to arsenic in the cases that are attributed to it. The destructive action of arsenic does sometimes appear to stop within the tooth, at points varying in different cases from the apex almost to the surface of the application, so that after removing the arsenic at the end of forty-eight hours, and then keeping a dressing of tannin (in either glycerine or alcohol) in contact with it a week or more longer, instead of finding the expected dead and hardened tissue sloughed from the living exactly at the apex, we find a portion only to have separated, and the pulp in some portion of one or more of the root canals very much alive and exceedingly sensitive, or what is equally unsatisfactory, it may appear to be very sensitive, without showing any other signs of life. I say appear to be sensitive rather than to say is sensitive, because it is not always easy to determine the location of sensation, or to

be sure whether it be just the portion in contact with the end of the broach where the sensation is felt, or considerably beyond that toward the apex, or even beyond the apex of the root. Wherever it may be it is often very troublesome, and I always hesitate, and usually refuse to reapply arsenic, unless bleeding indicates unmistakably the existence of vitality, and I do not often do so even then. In such cases, though a barbed broach or a large one may give great pain, it is sometimes practicable to carry a fine one along the side of the canal to the apex. If that can be done, by dipping the end in strong carbolic acid and carrying it up repeatedly till the acid has reached the end, the escharotic and anesthetic effect combined will usually enable us to remove the tissue without further pain (and this is almost the only purpose for which I ever put strong carbolic acid into a pulp chamber or root canal except in a few cases in temporary teeth). Not very infrequently it is better to renew the application of tannin, shut up the cavity, and wait, but in a few instances it appears as if the effect of the arsenic were more complete and satisfactory at the end of forty-eight hours than ever afterward. It being possible at that time to carry a broach carefully to the apex, the removal of the entire pulp will cause only the single twinge of breaking it at the foramen, or may not even that, while if removal is delayed a week or more, some part, more or less, of the tissue in the canals appears to have recovered from the benumbing effect of the arsenic and to grow more and more alive and sensitive the longer time is given to it. In other words, the arsenic has not killed the whole of the pulp. It is rather difficult to be quite positive on this point, for we cannot very well try both plans on the same tooth, and can only judge by the analogy of apparently similar cases.

The removal of pulps and filling of root canals.—Different cases present all imaginable degrees of difficulty, from the simplest of operations to those which are quite impossible. There should be suitable instruments, experience and skill, and an expenditure of time and patience that often have little relation to the fee that can be collected. Reaming of the portions of canals nearest the pulp chamber may often be done with great advantage; sometimes it may be carried far on toward the foramen, but always requires close attention and watchfulness. About the only instruments I have used with any satisfaction are the Talbot reamers for opening

the canals from the chamber a little way, in such cases as they can be made available, and the Gates or Glidden drills, and the only ones of the latter that I have ever got that were good for anything were made by the S. S. White Company. Others have had shanks too large or too small, too stiff or too soft, or the blades would not cut, and even the White instruments of this class are often faulty in temper. The Talbot reamers usually break if any lateral strain is put upon them, and I think I never saw a Glidden drill that did not lose its fine directing point the first time it encountered a curve in a root so as to be required to do any directing, but notwithstanding these defects they are about the only things that I could ever get very far into root canals with to do much good in the way of cutting. The drying of canals is accomplished by absorption upon cotton wound upon a broach, or by paper cones, followed by chemical action of something having affinity for moisture, like alcohol, chloroform, or some of the essential oils, with which the canals may be filled, and then wiped out repeatedly, or it may be done by conduction of heat from a bulb of hot metal through a wire inserted in the canal, like the Woolley or Evans root driers, or by inserting a wire in the canal and heating it by an electric current. In this, as in all other operations upon roots, the difficulty increases with the smallness or crookedness of the canals. Some form of gutta-percha is undoubtedly the best material for filling root canals that has yet been in general use. So far as heat can be used to produce the required plasticity, it is better than a solvent. I believe it is a common practice to fill canals with gutta-percha solution in chloroform, after moistening the walls with eucalyptol, and then insert cold, a round cone of gutta-percha, displacing so much of the thin solution as can be done in that way; but a round cone will seldom fit a root canal very well, and the subsequent evaporation or diffusion of the chloroform often leaves a seriously imperfect filling, as we have all observed in a sufficient number that we have had to remove. It is better to use a cone made very plastic by heat and pack it in with hot wire, displacing as much of the chloroform solution as possible and evaporating a portion of the chloroform from the remainder by the heat, the object being in each case to use as small a proportion of the solution as practicable, and especially to make the portion of canal filling nearest the pulp chamber so tight as to be as near germ proof as possible, so

that in case of leakage or loss of the crown filling, infection may not be able to enter the apical space through the root canals. This plan has the disadvantage of taking much more time than the other. (I have had a rather unfortunate propensity to discover that the best methods of operating often do take the most time.)

I like best myself a method still slower, perhaps, using eucalyptol as a solvent instead of chloroform.

For dental purposes the "pure volatile eucalypti extract," made by Sander & Sons, of Sandhurst, Australia, should always be used, and not the oil of eucalyptus sold in the drug stores. The canal is slightly moistened with eucalyptol and a warm cone of Hill's stopping, usually very small, is dipped in the eucalyptol and carried into the canal, then is churned into plasticity or semi-fluidity and at the same time worked up to the foramen with a Donaldson broach fine enough to go there. I cannot tell you how you may know when the material has reached the foramen, but a little watchful experience will teach you how to recognize the fact usually We hear people speak as if it were the easiest and most certain thing in the world to know that by the sensations of the patient, but I believe that test is entirely fallacious and unreliable. I have seen canals in which a fine broach wound with cotton could be carried to the foramen without sensation, respond sharply, so that the patient would wince and complain of the pain, upon the entrance of the filling into the canal, before the material or the instrument that carried it had gone one-third the distance from the pulp chamber toward the apex. The fact is that but little attention need be paid to sensation, unless it becomes seriously painful, until the material has been carried to the foramen. Then a moment or two of waiting will often cause the pain (which is usually slight) to subside, and after that a renewal of it may be an indication that the pressure of the packing instrument is too great and the material is being forced through the foramen. It is a more common occurrence in my practice than I wish it were, to have teeth show some peridental irritation for a few days after filling their roots. I have found it very difficult to understand or explain. It is usually slight and transient, but occasionally amounts to serious pain, of considerable duration, and sometimes accompanied by some swelling of the gums. All these cases have been quite free from

pain or soreness for considerable time previous to filling, and have been tightly closed. I have not been able to account for it except on the supposition that some slight portion of the medicine used to make sure of perfect disinfection (often oil of cassia, but often only eucalyptol) has been pushed forward by the root filling through the foramen, and has irritated the peridental membrane. Doubtless in some cases also some portion of the filling is pushed through. These irritations are never followed by the formation of abscesses unless the filling is done before cure is complete, and it is very rare indeed that one of them makes any trouble afterward.

## PYROZONE FOR STAINED DENTINE.

DR. E. C. KIRK, PHILADELPHIA, PA.

Dental Cosmos, November.

The ethereal solutions of hydrogen dioxide known as pyrozone, antiseptic and caustic respectively, are extremely useful in operative dentistry, in addition to those well known and in common use.

In removing the discoloration resulting from leaky fillings, especially in the incisors, we frequently find the tooth-structure under such fillings non-carious, but stained to a considerable depth, and where it would be imprudent to remove it on account of possible damage to the pulp. To place a new filling with the stained structure around it leaves the tooth practically unimproved so far as appearance is concerned, and the filling, no matter how skillfully done, still presents a suspiciously leaky appearance. If, after all carious structure is removed and the cavity is properly prepared for the reception of the filling, an application of ethereal pyrozone is made upon asbestos wool, and the solvent evaporated by the air-blast, the discoloration of the dentine will be removed in a few minutes, and the subsequent filling, if properly made, will measure up to the qualification demanded of Cæsar's wife. The treatment of all cavities by antiseptic pyrozone just previous to the insertion of a filling, whether they are discolored or not, is pursued by the writer as a routine practice for the sterilizing and detergent effect of the preparation upon the dentine.

# PROSTHETIC DENTISTRY.

## CLASPS FOR PLATES.

DR. G. A. M'MILLAN, ALTON, ILL.

Dental Review, March.

The use of clasps of gold upon rubber plates when properly made, is most heartily recommended. I often leave one tooth, especially on the lower gum, for the purpose of clasping, and have been astonished at the result. Be sure to use the clasp as wide as the tooth will admit, fitted only to the largest diameter of the tooth; do not try to fit the whole surface of the tooth unless you care to go to the trouble of first fitting to the tooth a band of pure gold, then over this solder clasps. My method, unless one is expert enough to fit the clasp onto the tooth in the mouth, is to take an impression of the tooth or teeth to be clasped, pour the impression with Mellot's or other easy flowing metal—this, when separated from the impression, will give you the tooth to be clasped, in metal; over this metal die bend the clasp until it fits the largest diameter; now remove, and bed or push the clasp into charcoal, or pumice and plaster about half the width; now solder a good strong lug upon this band by laying the lug against the band, using at least 14-carat solder; remove and place the clasp on the tooth in the mouth; see that it does not bear upon the gums—remove and flow a little hard wax—a little resin added to beeswax will make it —on the inside of the clasp, and while warm place it over the tooth; be sure it is placed and held where you want it to remain in the plate; upon this point your success or failure depends; the clasp must remain immovable when the impression is being taken; now you are ready for the impression. Take it in plaster alone. Many use stiff wax first, cut out around the clasp, fill with plaster and reinsert. I prefer plaster alone. This method applies to all parts of the mouth.

## TAKING BITE.

DR. M. HAYTER, DALLAS, OR.

When, say, a full upper plate is to be made, if there are some teeth to be extracted, and any of them articulate with the lower teeth, or any one of them articulates well, extract all but that one and then take the bite. The articulating tooth acts as a guide, giving the exact length of the artificial teeth and the relation of one jaw to the other. After the bite is taken remove the remaining tooth.

## FOR SHORT BITES IN RUBBER PLATES.

MR. CARDELL.

Dental Record, November.

Mount the piece in wax, try it in the mouth, care being taken to see that the patient articulates in every manner possible. Flask, and then pack with rubber as usual; now take any odd pieces of metal in the tray and cut them into short strips about three-sixteenths of an inch in length, curling each end towards each other. Press these into the biting surface of the rubber at short and regular intervals, with the free ends imbedded in the rubber. When vulcanized and polished the bite will be found studded with small pieces of metal, representing the hard and soft portions of an elephant's molar.

## GOLD ATTACHMENTS IN CASES OF CLOSE BITE.

DR. W. A. ROBERTSON, CROOKSTON, MINN.

Dominion Dental Journal, January.

It frequently happens that we are called upon to replace one or more teeth by means of a plate, in which the bite is so close that it is not possible to use rubber as an attachment. So in cases when the patient cannot afford an all-gold plate, we are in the habit of attaching the teeth by an extension of gold plate into the rubber.

Having obtained a correct impression and bite, select a plate

tooth to correspond with the natural ones remaining, and grind it to fit closely to the gum. When this has been done, attach the tooth by a little wax to hold it in position, and varnish and oil the labial portion of the cast around the tooth, and run a little soft plaster over it, sufficiently to just cover the cutting edge, by using a little sulphate of potash. This only takes a minute or two, and is of great convenience in attaching the backing, etc. When hard remove the wax and investment, and back up the tooth in the ordinary way. We have found the use of a little fine cardboard (that in which the manufacturers send out the solder is generally handy) very convenient in shaping the backing. Press the pins through it and trim with a pair of scissors to the size the packing is to be, and by using this as a pattern, it is easy to cut the packing and punch the holes. When this is done, place the tooth back in the investment, and set back on the cast to see that the backing does not interfere with its going to place. If it is all right cut a strip of gold plate (No. 30 is strong enough) about the same width for single teeth as the backing, and about one-half inch in length. Punch a few holes in this and bend to conform approximately to the roof of the mouth on the cast; lay it in place and close the bite to be sure it is right. Fasten to the backing with a little sticky wax, and remove from the cast and invest in plaster and sand, equal parts, and solder. If the work has been carefully done, the soldered piece will go right to place, and the waxing up may be proceeded with. It is well to finish up the solder, etc., before waxing, as it is more troublesome to do when the plate is completed. When there are two or more teeth, we generally use the gold extension a little wider than for single teeth, attaching it midway between the two. This will be strong enough and save time. In packing the rubber, draw out a small piece and then work it carefully under the gold extension, so as to insure it perfect imbedding in the rubber.

## CORRECT ARTICULATION.

DR. W. H. STEELE, FOREST CITY, IOWA.

Items of Interest, September.

It is not only essential, but absolutely necessary, that we should have a perfectly natural close of the mouth, and a correct articula-

tion, when constructing an artificial denture; otherwise it will be worse than useless to the wearer. It is almost impossible to get a natural close of the mouth if one depends on a first bite (or any number of bites) and wax rims only. I have followed the method given here for ten years without failure. For illustration: We will take a full upper. Get a perfect impression, make a cast and pattern plate as usual. Try the plate in the mouth and trim till it fits easily to place; remove and put on it a rim of softened wax; have just sufficient to receive the remaining natural lower teeth. Put the plate and wax in the mouth; have the patient throw back the head, swallow, and close the teeth into the wax; remove the bite, pour the teeth, and mount in an articulator; that will allow of the bite being changed in all directions; when the plaster is set, open up and remove the wax; now mount the six anterior teeth in the correct positions and try in the mouth; have the patient laugh, talk and smile, getting the different expressions; if the teeth are not correctly mounted, reset and try till they are right. Now build up with wax on each side where the lower bicuspids will strike, also extending behind the upper cuspids, so the lower cuspids will touch it; build the wax high enough so the lower bicuspids will bed the cusps in when the mouth is closed; smooth the top and put in the mouth. After the plate has been in position a few minutes tell the patient to swallow, at the same time gently close the mouth till the lower ones dent into the wax; remove the plate and put it on the cast. Now close the articulator carefully; if the lower bicuspids and cuspids close exactly into their proper places in the wax there is no need of a change, but if they do not, try the plate in the mouth till sure of having corrected the bite; then loosen the set screws of the articulator, adjust the plaster teeth in their proper places in the wax, and tighten the screws.

## WORKING ALUMINUM.

BY W. H. STEELE, FOREST CITY, IOWA.

Ohio Dental Journal, December.

Aluminum is an excellent substitute for rubber, and my experience proves it to be far superior, in every way, for either full or partial dentures.

The aluminum plate used must be absolutely pure, and must be

worked so as to keep it pure during the entire process. If the plate contains the slightest traces of iron or silica, it is unfit for dental purposes. The die should be covered with thin, tough India tissue during the process of swaging, and a couple of thicknesses folded over the plate, to keep it from coming in contact with the metal of the counter.

Do not use salt or anything of the kind in the investment, and do not have zinc in the boiler when vulcanizing the rubber attachments.

## TO FACE A PLATE WITH PINK RUBBER.

DR. J. T. FLEMING, HARVARD, NEB.

When plain teeth are used, it is desirable to use pink rubber for the gums. By the following method it is easily and quickly done, without any of the pink showing through the lingual portion of the plate, or any of the plate rubber showing through the pink facing.

Invest the case as usual, letting the investment come to the edge of the wax only. Fill upper half of the flask, and, when opened, paint the portion where the pink rubber is desired with a thin solution of pink rubber dissolved in chloroform, letting it come down well between the teeth and nearly to the pins.

Cut some small triangular pieces of pink rubber, and after heating the case slightly to drive off all the chloroform, put these pieces between the teeth, filling up all spaces, using larger pieces for the balance of the facing. Now heat a spatula, not hot enough to burn the rubber, and go over the whole, when the rubber will spread as easily as wax; a few tests will tell how hot to make the spatula. Then pack and flask as usual. Cut gates at heel of flask only.

## GUM FACINGS ON PORCELAIN TEETH.

SIGNOR CALVETTI, FLORENCE, ITALY.

Signor C. uses finely pulverized pink glass for making gum facings on mineral teeth. The glass powder is made into a paste with distilled water, and laid on the cervical margin of the porce-

lain tooth by means of a small brush. The tooth is then put into a small crucible scooped out of pumice stone and heated with a gas or spirit lamp till the glass cakes. When a glaze has been obtained, the glass will stick firmly to the porcelain, and can be ground like the ordinary porcelain gum.

## WALKER'S GUM FACING ON RUBBER PLATES.

DR. L. L. BARBER.

Ohio Dental Journal, August.

When the case is waxed up try in the mouth—if the fulness and shape is correct—remove and carve wax festoons and smooth up exactly as wanted when case is finished. Now you are ready to flask; this is done in the usual way, having the plaster to come only to the edge of wax in first half of flask; trim nicely, smoothly; try the rim of flask on to see that it comes down tight all around; it must do this. Then rub the plaster with plumbago or paint with thin shellac. Then place second half of flask and pour, after putting plaster on the face of teeth, so as to get it between them and avoid air holes in the plaster. After plaster hardens, separate, wash and dry, having cut waste gates only in the back part of plaster; do not cut any in the front of plaster. Now you are ready to paint the plaster in second half of flask, representing face of gum, with a solution of chlora-rubber (the best solution I have found is Akron grey rubber, cut in chloroform, then allowed to settle, and pour off the clear solution). Having painted the face of plaster, representing the gum, and having Walker's gum facing warmed, place it exactly where you want it, first small pieces between the teeth, then one long piece of sufficient width to cover the whole face, pressing it down all around the teeth, and the solution of Akron grey will hold it exactly where it was placed, not allowing the red rubber to come through and show on the face of the plate; and if you do not cut waste gates in front, it also helps to prevent the spreading of facing and so prevents streaked appearance, so often seen with Walker's facing, which entirely spoils it. After the rubber is all in, heat the flask in dry heat, not too hot, but enough to admit of closing flask, which I do with a large screw clamp. By using dry heat you harden the cast as you soften

the rubber. When you vulcanize, if you use a water bath, put but a small amount of water in and then raise the flask up from the water and vulcanize slowly. When done you have but to finish face with brush and felt wheels. If the few rules are followed you have used the minimum amount of facing and obtained the best possible results with the least work.

## FINISHING RUBBER GUMS.

DR. W. T. JACKMAN.

Ohio Dental Journal, April.

A small rubber cup corundum, flour and water, will finish quickly, easily and beautifully around the necks of the teeth. The cup is mounted on an engine mandrel.

## FINISHING RUBBER PLATES.

Zahntecnische Reform.

In order to procure better finishers for vulcanite plates than files and scrapers, make some cork cones on the lathe or engine. Make a slit in a cone, insert into it one end of a sand or emery-paper strip, and wind the rest around the cone. Hold in place by an elastic band. With these polishers one can readily cut off the surplus from a rubber plate, leaving the surface smooth and not with the scratches and furrows that are left by the file and scraper.

## FINISHING RUBBER GUMS.

DR. B. H. CATCHING, ATLANTA, GA.

Make a mandrel, for the hand piece, of wire. Split one end about a half inch with a fine saw, dress it to a point. Use in the hand piece with a sandpaper strip caught in the slit and wound on cone fashion. The point of the mandrel, with the paper on it, will enter the space between the teeth and finish where it is so difficult to do otherwise.

## TO KEEP FLASK FROM BOTTOM OF VULCANIZER.

Dental Record, November.

Mr. Butcher says place an ordinary upholsterer's spring under the flask.

## PINK RUBBER GUMS.

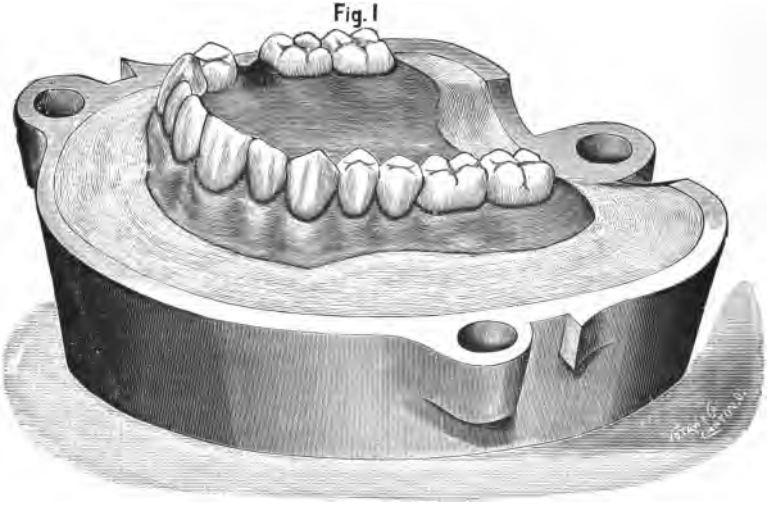
DR. GRANT MITCHELL, CANTON, OHIO.

Ohio Dental Journal, August.

An experimental experience of several years has demonstrated that the most satisfactory results to be obtained from the use of pink rubber are reached more through the manner of flasking and packing, than any of the purely theoretical ideas yet suggested.

It has been ascertained that "quality" is developed in as high a degree by vulcanizing at the usual temperature (320 F.) and ordinary period (one hour), as when vulcanizing has been prolonged, at more moderate degrees of heat.

Fig. I



It is unnecessary, then, for the dentist to devote attention to more than "artistic effect" in the matter of pink rubber. To obtain such object with but little more labor than is required in the ordinary process of packing, the case should be waxed, trimmed

and smoothed with as great care as if it were thus to go into the mouth. (As a labor-saving device, this might be recommended to many, to be tried on other cases.) A point is marked on the wax, on the median line, at a height to which the pink gum shall extend. Invest to this point, and, with spatula, manipulate the plaster while setting, so that it leaves a smooth, straight line all around. See Fig. 1.

Pour the other side, being careful to avoid air bubbles. (The easy way to do this is to thoroughly soak the model before investing. The pores of the plaster model being thus filled, it will not extract the water from the investment, leaving it stiff and unyielding to the air pressure.)

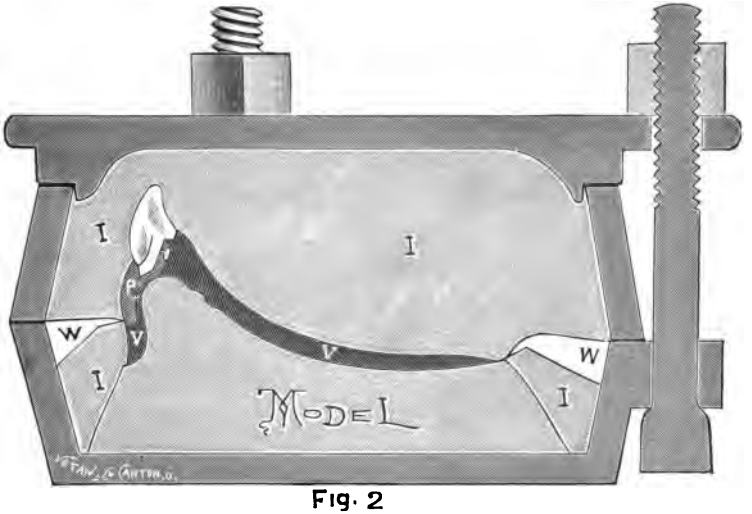



Fig. 2

After an hour the wax may be removed, and waste-gates cut. This is by no means an unimportant part of the proceeding. Waste-gates cut as they often are, by scoring the investment with a series of radiating lines, are almost useless, and in connection with gum sections occasion fracture more often than any other cause.

Rubber softens under heat. It does not become fluid, especially in closing a flask. It is necessary, therefore, to make provision for the escape of surplus in such a manner as will permit a general spreading of the softened mass. To do this cut a deep gutter in the lower half of the flask, from within a quarter of an inch of the model to the rim, extending entirely around the flask.

Slightly bevel the portion of investment left standing, from the edge near the model to the gutter, leaving a sharp edge of the plaster standing out toward the model. See sectional Fig. 2, ("I I", investment, "W W" waste-gutter.) It is usually better now to let the case stand over night, or at least for a few hours, to harden thoroughly.

Take the wax that has been removed from the case, attach it to the end of a packing instrument, and place it at the bottom of a tall, slender bar glass, nearly filled with water; tear off a tiny corner of paper and stick to the side of the glass at a level with the water. Remove the wax and cut, first, two strips of pink rubber, three and one-half inches long by five-sixteenths and five-eighths, respectively, in width; drop these into the glass, then fill with other rubber until the water again reaches the mark indicated by the paper.

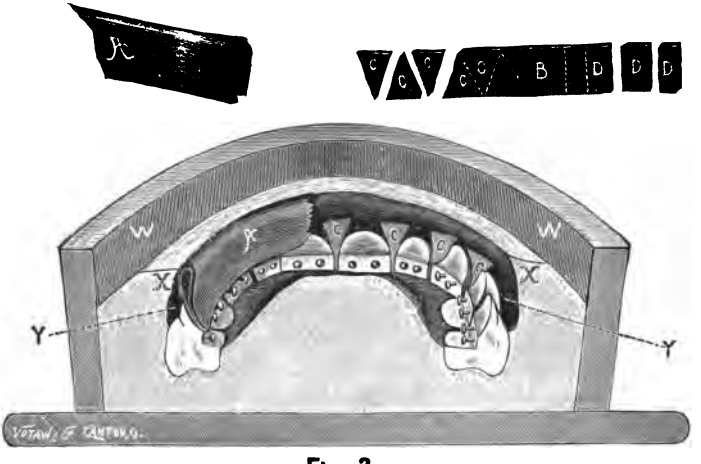



**Fig. 3.**

Have a stew-pan, nearly filled with water, and covered with a piece of perforated tin, such as is used for strainers; take the five-sixteenths strip of pink, and cut fifteen to twenty small, triangular pieces, shown at Fig. 3, (C C C) and the balance of the strip, cut into small blocks (D D D). Distribute these over the surface of the perforated tin, and place the whole on the gas stove and allow the water to come to a simmer. (Overheating causes the rubber to stick to the tin, and detracts from the quality.)

Many advocate warming the flask before packing. This is

unimportant. The rubber being warm will pack well, however the flask may be.

Begin with a triangular piece and pack between the centrals, carrying it down to the plaster level. Continue thus to fill between the teeth, back to the first molar on either side, building out to a thickness sufficient to make the rubber nearly flush with the posterior side of the teeth.

Next, take short strips of red rubber, wide enough to pack nicely under the pins, then with broader pieces cover a portion of the palate.

The spaces marked "Y Y," Fig. 3, should be filled with the blocks "D D D." Take, now, the broad strip of pink, fold it over on itself (A, Fig. 3) and lay around just over the pins, from molar to molar, allowing the fold to extend very slightly beyond the plaster edge (X X); press it in close with the fingers and finish the side with red rubber.

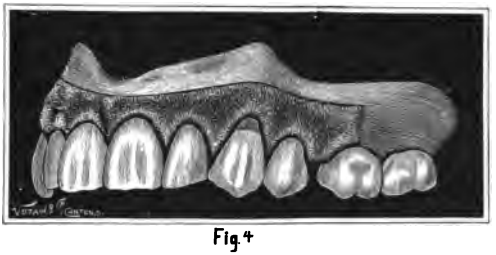


Fig. 4

The space between the model and investment, in the lower half of the flask, should be packed solidly with red rubber, and flush with the plaster edge.

Close the flask without displacing the pink fold "A." Exert pressure with the flask press so that it will be even on all sides. The surplus thus oozing out will cut off the pink rubber on the edge of the plaster so straight that I have often been asked, when exhibiting a specimen of this work, whether it were not "cut out and vulcanized a second time." Fig. 4 is drawn from a set in practice made as above described.

## PINK RUBBER GUM FACING.

DR. ABRAM PELHAM, PLYMOUTH, MICH.

Remove the wax plate from the model and cut away the wax from first bicuspids close up to the teeth. Place wax plate back on the model, and with a fine pointed instrument mark where the wax is removed. Paint this space on the model with vulcanite dissolved in gasoline, cut a piece of rubber to fill the space lined on the model and stick it on. After warming it carefully place a piece of pink rubber on the base plate rubber; replace the wax plate and wax up around the teeth; fasten the whole on the model, then cut a piece of tin foil size of space occupied by pink rubber and cover the same with it. In bedding down let the plaster come up just on the teeth. Proceed in the usual manner to invest. In packing see that the red rubber unites with the red, and pack around the teeth a little more pink rubber to make sure.

## PLASTER IMPRESSIONS AND MODELS.

F. H. GOFFE.

British Journal Dental Science.

The writer says he adds a small quantity of vermilion to impression plaster to enable him to distinguish the impression from the model. For easy separation of the two, he coats the impression with a thin mixture of linseed oil and vaseline.

[Excellent results are obtained by coating the impression with thin shellac varnish; after drying, place in water while mixing the plaster; take from the water and shake off the surplus and pour the plaster.—ED. COMPENDIUM.]

## PERFECT IMPRESSION FOR PARTIAL UPPER PLATE.

DR. J. G. TEMPLETON, PITTSBURG, PA.

Ohio Dental Journal, January.

To take an accurate impression of the mouth for a partial upper set of teeth, smear plaster over the roof of the mouth with

the finger, take a string about one foot in length, tie the ends together, put the tied end of the loop into the plaster on the roof of the mouth, and add more plaster to thoroughly imbed the knot, leaving the loop of string hanging down. In placing the plaster in the mouth care should be taken to have it come full half way over the grinding surfaces of molars and bicuspids and cutting edges of the front teeth; then trim the plaster and varnish the trimmed surfaces. The plaster should be so trimmed that it will fill up fully one-half of all spaces between the teeth; then cover all the remaining surface of the mouth and teeth with plaster, being very careful to have the teeth well covered and spaces filled in, putting on plaster for the buccal and labial surfaces. When set, the plaster impression readily parts where it has been varnished, the palatal portion is dislodged with the help of the string used, and the pieces are then placed together and model made. If a tooth is irregular, use modeling compound about it and trim suitably; then apply the plaster. When removing it breaks where joined; then remove compound, place in position in the impression and pour the model.

## COVERING MODEL WITH TIN FOIL.

DR. J. D. PATTERSON, KANSAS CITY.

Western Dental Journal, December.

Before finally closing the flask, use tin foil, Nos. 10 or 12, upon the model, pressing to place with a pad of cotton or soft napkin. Then remove and coat model rapidly with sandarac varnish and again press the foil carefully to place. When the varnish dries, smooth and polish with the pad of cotton or the finger and thumb. After vulcanizing, remove the tin by placing the case in a bath of nitromuriatic acid. Don't use other methods because you have been told that the foil will occupy space enough to injure the fit of the plate. It won't.

[Another way is to lay a sheet of No. 10 tin foil on a clean surface and coat it with liquid silex; place this side on the model and smooth down by using as above cotton or bibulous paper. Coat the side next to the rubber with a film of soap water, and the tin will not attach tightly to the rubber.—ED. COMPENDIUM.]

## TO DUPLICATE MODELS AND IMPRESSIONS.

DR. J. G. TEMPLETON, PITTSBURG, PA.

Ohio Dental Journal, January.

Take printers' roller composition, melt in a water-bath until dissolved. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition over the model. Let this stand over night. By morning the material is hardened and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary. Impressions may be duplicated in the same manner by using impression instead of model.

## INVESTMENT MATERIAL.

Equal parts of plaster and coal ashes is said to make excellent investment for soldering.

## WIRE GAUZE IN INVESTING.

DR. W. H. WHISTLER.

Ohio Dental Journal, August.

For investment use strips of wire fly screen to bind plaster so that it will not crack in drying out. The meshes of the screen stuff form excellent attachments for the plaster to adhere to.

## DRILLING CAVITIES IN ARTIFICIAL TEETH.

International Dental Journal, December.

Dr. E. T. Davis, of Bridgeton, N. J., says such can be easily made by using an inverted cone or wheel bur wetted with turpentine.

## ARTICULATING TEETH.

DR. J. G. TEMPLETON, PITTSBURG, PA.

Ohio Dental Journal, January.

Always take an impression of lower teeth when making an upper set, and in taking the bite have wax trimmed to show the length you wish the teeth to be, and bite into it just sufficiently to show the tips of cutting edges and cusps where the model made from lower impression can be placed in proper position, etc. For double sets make wax models for contour in restoration of features and to show length of teeth, and then try these models in the mouth, being careful to see that you have it right; then make plaster articulating models for setting up the teeth, setting up the lower ones first against a plaster articulating plate, its articulating surface corresponding with the articulating surface of lower wax model; then lay aside the plaster articulating plate and put the model of upper jaw in its place, and set the upper teeth to the lower ones. I adopted this method about twenty-four years ago, and in that length of time have not had to grind a cusp off to let front teeth come together.

## TO RE-SWAGE A METAL PLATE HAVING TEETH ON.

DR. R. E. SPARKS, KINGSTON, ONT.

Dominion Dental Journal, December.

Gold plate, one central incisor and the bicuspids and molars. It seemed to come out of the investment beautifully, but to fit it in it raised up from the palate badly. To try an experiment I placed the plate upon the die, removed it and marked the die around, about where the palatal side of the artificial teeth would stand, then cut away the metal where any of the teeth would be likely to touch the die; then built up a ring of putty outside of where I had marked the die; ran a lead counter in the putty ring; replaced the plate upon the die and formed the counter to fit the palate without touching the teeth. A few blows with a hammer upon the lead, while an assistant held the plate firmly on the die, brought it into very good shape.

# ENGLISH TUBE TEETH—THEIR USE IN PLATE WORK.

DR. JOHN GIRDWOOD, EDINBURG, SCOTLAND.

International Dental Journal, October.

The absence of a detailed description of the method of using tube teeth from any of the standard American works on operative or mechanical dentistry has long been a subject of surprise to me. It still puzzles many of the leading dentists in Europe, and particularly in England, where the tube teeth are still largely used, and found, where judiciously employed, superior to flat teeth, to know why the system universally practiced here before the introduction of vulcanite should have failed to attract any notice in America.

The English tube tooth differs from the flat favorite in one essential—viz: that its attachment to the piece to which it is adjusted is effected by means of a central tube (running through the body of the tooth), and into it a pin or post is introduced.

Before proceeding further, it may here be well to set before you a few of the advantages claimed for tube over flat teeth.

First.—Although adaptable in any situation on both jaws, they are specially superior as masticators. They are much stronger than their flat rivals. The tube tooth is supported over its whole lower surface, and the greatest strain in occlusion falls mostly in a vertical direction upon the crown, whereas in a flat tooth the impact of the bite is more evenly distributed.

Second.—They allow of easy removal for repair.

Third.—In soldering the backings of flat teeth to the plate, the danger of warpage is great. By the use of tube teeth this risk is entirely removed.

Fourth.—They are more adaptable; a very long tooth can be cut down to any length, and, the body being of the same texture throughout, can be ground and polished perfectly.

Fifth.—They can be used for plate, crown and bridge work, and in some cases in combination with vulcanite. From their ease of adaptability, a small stock of these teeth goes a long way. Hence they are cheaper.

Sixth.—Being a more faithful reproduction of the teeth they replace, they feel more comfortable to the tongue, and are less bulky.

Seventh.—They are more easily kept clean, because backings are done away with, and better supports substituted, which being surrounded by porcelain are out of the reach of any impurity.

For crown and bridge work they have all the advantages already enumerated, and, in addition, they can be more perfectly and directly fitted to the root than any other form of porcelain crown. They retain when mounted for wear in the mouth their translucency and natural appearance, qualities so often destroyed by the gold backing.

There seems to me, however, to be one defect in the tube incisors and cuspids as at present manufactured. In these the base is frequently too small antero-posteriorly, and, consequently, in many cases it is impossible with them to cover the root completely. Moreover, the tube is very often too near the front, thus destroying the axis of the crown with its root. The bicuspids and molars, however, are free from any such fault, and are preëminently adapted for crown work.

The application of tube teeth requires the use of a special set of simple hand tools which had best be described here:

A counter sink for clearing away the bur which forms upon the end of the tube when ground, and for slightly enlarging the orifice of the tube at its base.

A tube file used to remove the débris from the tube after grinding.

A marker. This is a piece of straight round wire which should fit the tubes easily, but not loosely, and have one end filed almost to a central point.

A pair of flat-pointed pliers with a longitudinal groove in them for holding the pin while it is inserted in its socket in the plate.

A sharp-pointed graver.

A length of gold pin-wire.

A pot of paint, made by mixing olive oil and vermilion.

Their respective uses will be best described in an explanation of the method of mounting the teeth for which they are required.

For this purpose we shall take, by way of illustration, a partial gold upper, where the lateral incisor and cuspid on the right side and all the grinding-teeth on both sides, except the second right upper molar, are absent. Having struck and fitted the plate in the

ordinary way, and fitted the clasp, a tube tooth is now selected for each side. Care must be taken that the teeth chosen shall be longer than is apparently necessary, so that some tooth substance may be to spare in fitting to the plate and bite. They are now roughly fitted in the positions they will occupy. The counter-sink removes the bur from the platinum tube at its ground end, and the tube file clears out all débris from end to end. Having seen that the tube is clean, replace the teeth on the plate and fasten them in their desired positions with hard wax. Now pass the marking wire tipped with vermilion paint down each tube till it touches the plate, where it will leave a mark showing the places at which the holes are to be drilled to receive the pins. Remove the teeth from the plate, taking care not to injure the color-mark. This undisturbed, take the sharp-pointed graver and make a slight pit for a drill; do not here take the plate from the model, but proceed to drill the holes for the pins, being heedful to keep the drill in every respect at the same angle as was made by the marker with the plate. By means of a broach the holes should be enlarged till they are just a little too small to receive the pin-wire full thickness; the rough edge or bur left by the drill must be removed by file and graver, and the hole slightly counter-sunk on both sides. A suitable length of gold pin-wire should now be cut, and the end which is to fit the socket in the plate should be slightly tapered, so as to fit tightly and project a little way through on the palatal surface. A slight groove may with advantage be made longitudinally on the tapered end of the wire, for it assists the solder to run more readily from the palatal to the lingual surface. The tapered end of the pin and pin-hole are then touched with borax, and the wire fixed firmly in place by means of the pliers, attention being paid to its direction. The tooth is next tried on, and having ascertained that this particular point is correct, we proceed to solder the pins, drawing the solder through from side to side. It is not necessary to invest the plate for this purpose, for the tightness of the pin in its socket will support it sufficiently. In soldering, it is of the utmost importance that the smallest possible quantity of solder be used. When the plate has cooled, the flux is removed by boiling in pickle. From the palatal surface cut off the projecting end of the pin, and smooth it down with corundum wheel and graver till it is level with the plate. Now replace the plate on the model, and file down the pins till they

accurately fit the bite. Place the teeth on the pins, and if the latter should have tilted in soldering, it will be at once seen and may be corrected by grasping the pin close to the plate and bending as required.

Now comes the fine fitting of the teeth, done best with small wheels. Paint the plate where the tooth will touch it, and press the latter gently to place; it does not fit; remove it, and a small red mark will show where it is too long; grind off here, and having used counter-sink and tube file, try the tooth on its pin again, and continue the process of alternate trying on and grinding till a perfect fit is obtained. Now grind the coronal surfaces of the teeth to suit the occlusion of the bite, using the vermilion paint freely. Next set the cuspid and first bicuspid on the right side, and these finished, the first bicuspid on each side serving as a guide, the pins for the remaining teeth may be inserted at one soldering.

The teeth are then polished and coronal ends of the pins are finished to show a rounded end, or ground to the bite according to the requirements of the case. This done, the plate is finished in the usual manner. Previous to fixing the teeth, a few shallow cuts are made in each pin with a fine file. When the teeth have been properly cleaned and freed from all traces of oil (which can be best done by boiling them for a few minutes in a strong solution of soda), their tubes are dried by cotton wound round a broach, and their interiors roughened by a clean tube file. The teeth are fixed with sulphur. This material is melted in a small porcelain Berlin cup till it is quite liquid, and is kept in this condition and held by an assistant. The operator himself grasps the plate firmly with the pliers in the left hand, and heats the whole carefully over the lamp. This must be done gradually, and the flame ought not to play on the porcelain. In the right hand he takes a wire spatula, and dipping it in the molten sulphur, conveys it to the heated plate and teeth repeatedly, till a surplus begins to show itself. The sulphur runs by capillary attraction under the teeth and along their pins, and when the whole has cooled it sets hard and the teeth are immovable. The excess of sulphur may be removed with a fine-pointed knife, and the polishing of the plate makes it ready for the mouth.

This description of the method of fitting tube teeth applies in every particular to every case, be it partial or full, upper or lower.

Besides the ordinary tube teeth, single gum teeth of this kind are to be had, and when judiciously used, they prove as satisfactory as flat-backs.

## TO OBTAIN EVEN PLATES, DUPLICATING THE RUGÆ.

MR. N. REEVE.

British Journal Dental Science, November.

The first thing is to obtain a piece of wax of required thickness. The pink wax supplied by the depots being of one thickness, and that too thick, it is convenient then to make a stock of sheets of varying thicknesses. For this a mixture of brown colored beeswax and old wax parings are melted together in a saucepan or pipkin and poured by any of the various methods. The table plate will be found as good as any. Take an ordinary large dinner plate, smear the surface all over with a soaped flannel, pour on the melted wax to the depth of about one-half an inch, and after about fifteen seconds tilt the wax quickly back into the melting pot, when a very even film will be found to remain on the plate; this can readily be detached by plunging it in a basin of cold water. An assortment of various thicknesses may thus be obtained.

The wax before pouring should be free from any of the minute bubbles which arise on the surface from overheating.

Next comes the bending of the wax to the model. The ordinary way of bending up wax by warming and pressing it on to the model with the thumb is open to the objection that the thumb being harder and more unyielding than the soft wax tends to press it very thin over the rugæ, and not at all into the interstices of the teeth. This may be avoided and the rugæ brought prominently and evenly on the surface by heating some modeling composition in water, rendering the wax pliable by dipping it for an instant in the water with the composition, then placing the wax roughly in position on the model and with the soft composition knead it well down into place; on parting the composition from the wax, the latter will be found to represent on the surface almost a duplicate of the surface of the model.

The composition has, of course, a tendency to stick to the

wax, if too hot. Should this give trouble, dry the composition first, and smear the surface of it with a little French chalk. In subsequently setting up the teeth and preparing for the flask, care should be taken that the surface of the wax is not cut or scratched; when finally ready for the flask the surface of the wax should be polished by lightly rubbing it with the finger tip or cotton.

In flasking, do not apply oil or soap to the wax surface. Carefully open after placing the flask in boiling water for a few minutes; it is always better to do this or it frequently happens that the smooth surface of the plaster is spoilt by particles of it adhering to the wax. Proceed with the packing in the usual manner. In the trial closing to test whether sufficient rubber has been used, I believe it is the usual plan to place a sheet of the calico supplied with the rubber between the halves of the flask before closing. A better practice is to immerse the reverse half of the flask in water before beginning packing; the moist surface on the plaster will be found ample to prevent the rubber sticking, and it does away with the annoyance of having the rubber and calico adhering, as they often will do, half pulling the packed rubber out of the flask in separating them.

Before closing finally, warm the reverse half over a gas stove till it is nearly too hot to bear the hand. Then paint over once with silicate of soda solution, with a fine camel's-hair brush; this will be found to dry almost immediately as a fine glassy film. Close and vulcanize. Remove the piece from the flask the same day to avoid the granulating of the plaster. Should any silicate be found adhering to the surface after it is washed and dried, a little hydrochloric acid will remove it.

A piece vulcanized in this manner will require but a very few minutes for finishing; the edges are trimmed up, the surface scrubbed over with dragon cane and pumice powder, and finished with lathe brushes.

In this connection I should like to mention a polishing powder, which if made into a paste with water, will be found a most excellent material for removing fine scratches from vulcanite pieces before finally going to the whitening wheel; it is no other than Brooke's soap. I can form no opinion of its composition except that it has a fine cutting property, such as one might expect from

very finely powdered and sifted glass, but it is a capital substance to use after the pumice and before the whitening.

In preparing edentulous cases for the flask, it is always a good plan to work in wax of two colors, the basement wax of dark color, the teeth being mounted on this with pink wax. So in finally contouring the gum the dark color underneath gives a reliable guide to the thickness, and if this is not cut through, we know to a certainty that there is a sufficiency of material, without removing the piece from the model.

The model should have, in all cases, a pencil mark round as far as we wish the plate to extend, both on the gum and palate. If trimmed up carefully before vulcanizing, an hour should be ample for filing up and finishing.

SECOND METHOD.

Should the foregoing plan of working not give a sufficiently accurate representation of the palate and rugæ, there is an alternative method by which the palate markings may be brought out line for line on the finished plate. It is a modification of Mr. Bennett's mode of working, for which he employed a Bell and Turner's flask. Briefly, the teeth are set up in the usual way, but before flasking the wax is cut completely out of the palate, leaving the portion only supporting the teeth, and that cut perpendicularly or very slightly sloping. The model is now flasked without wax in the palate at all. Bring the plaster just over the crowns of teeth; when set trim up and soap well all over the surface, then fill in the reverse half, allowing a good time for this to set. Separate the halves by tapping the sides and gentle levering. It is well before closing any flask to make a cross on the outside at the point where the leverage may be most advantageously applied.

The plaster representing the counterpart of the palate is next removed entire from the reverse half and trimmed away till little but the palate portion remains. This is replaced back on the model; having previously placed on the model a strip of wax the thickness it is intended the finished plate to be, plaster is again filled in. Of course this time when the flask is opened, the fresh plaster and the trimmed up palate are united together. Packing may now be proceeded with in the usual way.

There is one precaution that must be taken in manipulating

this method; the insertion of the strip of wax tends to throw the palate mold bodily backwards, so before closing after packing, the impressions of the anterior surfaces of the molars and bicuspids (should any be standing) will require to be slightly scraped with a sharp knife to insure an even thickness of rubber round the teeth.

It will also be at once seen that this process should only be used for fairly shallow cases, the whole arrangement partaking somewhat of the nature of two hats the same size within one hatbox.

There is one other little point I should like just to mention; it is in connection with those very awkward cases in the upper jaw where the six front teeth alone remain standing all close together. Suction is generally difficult to obtain, so it becomes necessary to make a gold plate with bands round the front of the canines. The patient very naturally complains of their showing. A good way to get over the difficulty is to cover the band if broad with white rubber, or if narrow and near the gum with pink. The band should be nicked with a very fine saw along both borders, the cuts being made close together and not more than one thirty-second of an inch deep. The rest of the surface being barbed with a sharp pointed graver, in alternate directions, paint over the band with chloro-rubber and press a fragment of warmed rubber well down over this, flask and vulcanize. Should it be afterward necessary to tighten the band, gently warm it before doing so.

## THIN RUBBER PLATES.

DR. A. N. DICK.

Items of Interest, January.

To secure the maximum strength without increasing the thickness of vulcanite plates it is necessary to make the mold so smooth that the rubber, when removed from the plaster, needs only the brush wheel to finish it. To accomplish this, first saturate the model with water, then dip it in a vessel of clean melted base-plate wax, and lift it out in such a way as to allow the wax to flow off easily. It is best to dip the back of the model downward. The surface of the wax in the vessel should be free from bubbles. If the first dip should not secure a smooth surface, the wax may be

peeled off, and the process repeated till it is satisfactory. After which repeat the dipping process till the deposit has the desired thickness. It is well, however, to leave it thinner than the desired plate till after the set is articulated, then after waxing up carefully, so that one more dip will give the desired finish to the base-plate, dip it in water so that the teeth shall be wet before immersing it in the melted wax. The wax deposited on the teeth will peel off easily. Cool the wax, and, with a sharp instrument, trim around the teeth and the edges of the base-plate, and it is ready for the flask. With a little care the surface of the base-plate may be made as smooth as glass, and the labor of finishing the rubber will be much reduced. A little practice in dipping a model will give one all the skill that is necessary to perform the work quickly and easily.

## PARTIAL LOWER DENTURES.

DR. E. L. TOWNSEND, LOS ANGELES, CAL.

Pacific Coast Dentist, July.

No form of plate seems to present so many difficulties of construction and use as those intended to supply the missing teeth of the lower jaw. The loss of either the bicuspids or the molars allows the adjoining teeth to lean toward the space, and render the removal of an impression nearly impossible without some damage to it. It

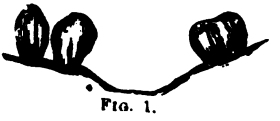


FIG. 1.

FIG. 2.

is, however, possible to get a good impression of a case, such as is shown in Fig. 1, by banding the teeth with rings of modeling compound, as shown in Fig. 2. The impression is taken in plaster with these rings in place. On removing the plaster and rings separately, the latter may be replaced in the impression and the cast poured. This ordinarily will give a true model.

If the upper teeth are remaining they sometimes elongate to such an extent as to render an articulation nearly impossible. In such cases the free use of the wheel in grinding the articulating sur-

faces to an approximation of normal length will be found beneficial, and, as these cases are at the best difficult to wear, all the aid possible should be given the patient, and anything that tends to make the case useful is eminently proper. In articulating the teeth the pressure should be more on the inner than the outer cusps, and inclined planes must be avoided. The nearer they approach the condition of a natural set of teeth well abraded, the more comfortable will the appliance be for the patient. Sharp cusps are not, as a rule, useful in artificial teeth.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

In many cases it is desirable to reduce the pressure on the gum to a minimum, and when it is possible a crown should be constructed with a shoulder, as is shown in Fig. 3, and cemented on the tooth. A band of clasp metal should be formed to fit the crown and rest on the shoulder, the band being made a part of the plate, as is shown in partial Fig. 4. This form of plate is open to some objection, but on the whole makes a fairly good denture.

In cases where all the molars are missing, and roots of either the bicuspids or cuspids remain, a combination of crown and plate can be used to great advantage. The root should be crowned with

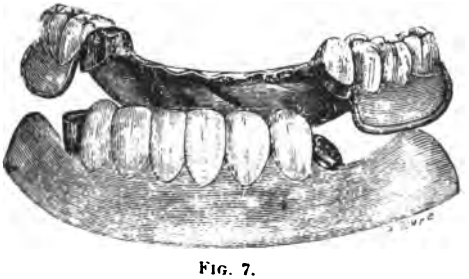


FIG. 7.

that portion of a Richmond crown shown in Fig. 5. This piece should be cemented to the root, and a band of clasp metal fitted to that portion above the gum and a porcelain face soldered to it, as is shown in Fig 6. This piece should fit nicely, so that it will slide

on and off easily, but not loosely. After No. 6 is finished and placed on No. 5, an impression is taken and a plate made, of which No. 6 is a part. The plate can be made either of rubber or metal, and will do good service. If there are no roots that can be used, a tooth can be ground down and a gold cap cemented to it and a gold crown made to telescope it; the crown becoming a part of the plate. Fig. 7 shows such a case, one side being constructed with a porcelain face, and the opposite with a gold crown. This combination of crown and plate will be found very satisfactory in many cases, and will in every way compare favorably with bridge work as to utility, and be immeasurably superior in point of cleanliness.

## STRENGTHENER FOR RUBBER PLATES.

WALTER COFFIN, LONDON.

British Journal Dental Science.

Mr. Coffin described a simple and easily made strengthener for inserting in vulcanite, especially adapted for inferior dentures, partial or whole, which he had used extensively with great satisfaction for many years. It consists of a metallic strip or wire of any section, preferably of oval or half-round platinum wire, and then wound or wrapped from end to end in an open spiral with a thin gold wire about the size of which the ordinary gold springs are made, the whole soldered together with very small pieces or filings of gold solder. The platinum wire is first bent as accurately as possible to fit the model, then wrapped and soldered. It then becomes very rigid, but still slightly elastic in all directions. Any clasps, bands or gold backings being used may be soldered to the strengthener. When not so held in place, a length of the thin wrapping wire may be left free at both ends of the strengthener and caught in the plaster when investing, to secure the exact position of it in the vulcanite. It is claimed for this form of strengthener that no line or plane of weakness is determined in the vulcanite; that there can be no longitudinal slip on bending; that the plate may be finished and polished right down to the gold without possibility of stripping or peeling in wear; that the strengthener occupies the whole thickness of the plate, showing slightly on both surfaces, while affording a maximum of strength.

## TEA LEAD FOR BASE PLATES.

DR. F. SKEED, SEWARD, NEB.

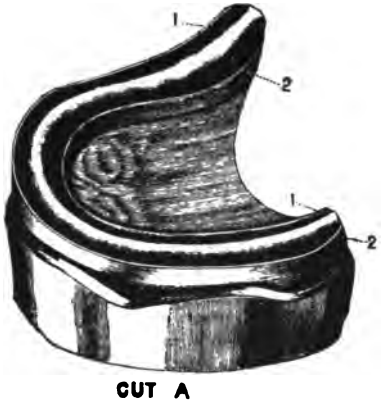
For base plate use common tea lead, using two or three thicknesses, as occasion requires, which, by the way, does not require more than half the thickness usually given to rubber plates, waxing where thickness is needed. After flasking and separating remove all wax carefully, then cover both casts with very thin tin foil, but always cover the model. Next soap well and pack, thus vulcanizing rubber between metal, insuring a nearly finished plate when it comes from the vulcanizer.

## COMBINATION CELLULOID AND ALUMINUM PLATE.

DR. W. H. STEELE, FOREST CITY, IOWA.

Ohio Dental Journal, August.

Take the impression; make the cast and metal die as usual. Make the die and counter in such shape as to leave a depressed margin, with raised rim about one-fourth of an inch from outside




CUT A

edges of the alveolar ridge of the plate. Now cut the aluminum for plate one-fourth inch larger than the pattern all around, except at the posterior margin. In swaging keep well annealed and gradually turn the gum margin rim as shown in the cut. (Fig 1, cut A). When the plate is swaged, cut an aluminum collar (Fig.

2). Put it on the die and swage so it will fit the plate, and reach close up to the palatine surfaces of the teeth (when mounted); fit to place and solder. Next take the bite, place in articulator and mount the teeth on wax as usual. Invest in a large size celluloid flask; when fully set open and wash out the wax; take a lower celluloid blank, of as near the size as possible, and trim it with lathe bur until about right to fill the place of the wax gums. Put in place, and carefully close in a dry or moist air celluloid machine. When cool, open up and finish as usual. In setting the teeth, if the collar (Fig. 2) should interfere, trim away with bur or file to let the teeth go to place. This method gives a beautiful aluminum plate, with just sufficient celluloid for gums and attachments, the rim and collar (1 and 2) firmly holding the celluloid edges to place. When the ridge—that part of the plate between the collar and rim—is properly roughened, it is impossible to remove the celluloid or rubber attachments from the metal plate. This plate can be made with vulcanite base, and pink rubber gum facings, or the swaged base plate can be made of gold, platinum or silver.

## RUBBER DAM FOR LINING PLATES.

DR. L. CROTHER.

American Journal Dental Science.

Rubber dam as a lining for vulcanite plates cannot be surpassed. Proceed as usual with the case and when ready for packing, first pack round the pins and flange; then cut a piece of red rubber the shape and size of the cast, large enough to come up as high as you will require the case when finished. Then lay a new clean, thin piece of rubber dam over this and cut out a piece to fit; remove and paint the red plate all over with good red or black rubber solder or cement on one side, being careful that it is all covered well with the cement. Now take the piece of dam and place it smoothly on the painted side of the plate; press well down; make it quite smooth, being sure there are no air bubbles. If the dam has stretched, which it will, trim the edges to the red plate. Place the plate in the flask so that the dam will come next to the cast. When closing the flask, be sure and see that the plate comes well

up round the flange so as to hug close to the model and not allow any red rubber to be forced inside. Close the case by dry heat. Use paper vacuums and not tin, as the dam will not harden over tin.

Rubber dam is better than gold for a lining, as it is a non-conductor, prevents sore mouths and makes a very tough plate, almost impossible to break; so you can make a thin, light piece of work.

## TO LINE RUBBER PLATES WITH BLACK RUBBER.

DR. L. L. BARBER.

Ohio Dental Journal, August.

Before packing, coat the cast three or four times with a solution of black rubber, allowing each to harden before applying the next.

## FINISHING RUBBER PLATES.

DR. G. C. BOWLES.

Items of Interest, January.

Use about one-third emery with pumice for finishing plates, and finish with half the labor and time, and scour the palatal surface of plate with oil or glycerine to remove the last trace of plaster.

## DUPLICATING RUBBER PLATES.

DR. A. N. DICK, WOODLAND, CAL.

Pacific Coast Dentist, July.

After filling the plate with plaster for a model, imbed the crowns of the teeth half their length in a piece of modeling compound, softened to receive them. Then attach to an articulator, after which separate the plate from the plaster and remove the teeth from the plate and set them in their respective places in the compound. Then burnish a piece of lead foil to the model so

that hot wax will not adhere to the plaster. Close the articulator, and with a hot spatula wax the teeth firmly to the foil on the model and cool the wax. Remove the teeth from their position in the compound and finish waxing up. In this way the teeth may be quickly, easily and accurately transferred from an old to a new plate. This course is advisable where a plate that has already been vulcanized two or three times needs repairing.

## TO ADJUST BROKEN PLATES.

DR. W. D. TICKNER, RANDOLPH, WIS.

Items of Interest, July.

To adjust and hold in place the pieces of a broken denture preparatory to mending, fill a lower impression cup with softened modeling compound as to take an impression. Press the teeth of plate into this, and bring the edges of fracture together accurately. When the compound has become hard dip the plate into water and fill as when making a model. As soon as the plaster is hard soften the compound and remove it, and proceed as the case requires.

## TO ADJUST BROKEN PLATES.

DR. G. Q. C. BOWLES.

Items of Interest, January.

Take a roll of wax, apply one end to labial surface of teeth, adjust plate, and secure by pressing wax to plate all around. By this means an accurate adjustment is easily secured.

## PARTIAL LOWER PLATE.

DR. NICHOL.

International Dental Journal, June.

I have prepared cases, using gold for partial lower dentures where the incisors are in position, and sometimes the first bicuspid, the object being to prevent the plate from pressing to the back part

of the mouth. They are used when there is no molar to prevent the plate being driven posteriorly. The plate is swaged in the usual way, the band extending around the ridge just below the incisor teeth, and the whole put in the mouth and filed nicely to fit. An impression is then taken, and the whole invested and soldered in that way. The purpose is to get a band of gold broad enough to prevent cutting into the ridge running around the front of the teeth or the ridge just below the teeth. One of the advantages is to prevent the necessity of using clasps. It is rarely that a bicuspid can be clasped with satisfaction, as it is not adapted for it; this method secures better results than clasping.

## MAKING PLATE BEFORE EXTRACTING TEETH.

Take impression, cut the teeth that are to be removed from the model, going a little deeper than the festoon of the gum. Select teeth of the proper shade and about one-third longer than will appear or show; allow the extra length to go into the sockets. Cut out in the model for the extra length, make plate, extract teeth and insert plate.

## SWAGING FULL UPPER PLATE.

DR. L. P. HASKILL, CHICAGO.

Ohio Dental Journal, March.

Anneal the plate by heating to a red heat, and put in sulphuric acid to clean the oxidized surface; oil the dies to prevent, as far as possible, the die-metal adhering to the plate; if any should adhere, be sure to wipe it off. Place the plate upon the die, and with the horn-mallet (not too pointed) shape to the palatal surface. In order to save time, cut the anterior edge to top of ridge and mallet over the outer border; place in the counter-die and strike one blow on the die, and see if the plate is in right position. If there is any tendency to buckling of the margins, especially over the tuberosities, mallet to prevent a fold. Repeat the swaging and

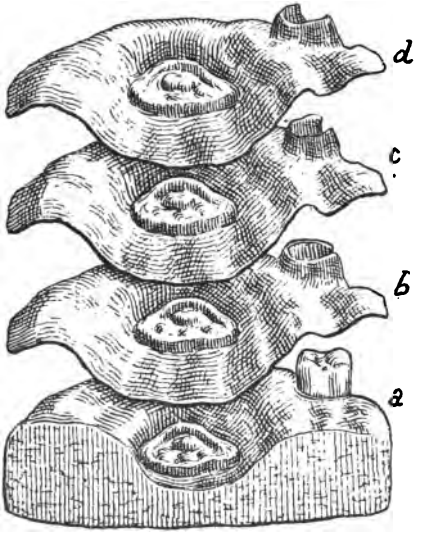
examination until all tendency to buckling has disappeared. Anneal the second time and finish swaging by solid blows on center of die, until slight impression of plate is seen on center of counter-die. Then solder the lap in front, cutting none out, by placing the solder upon the inside, having forced some borax between, and applying the heat upon the outside, so as to draw the solder through. This process also strengthens the plate in its weakest point. While hot drop into the acid.

## STRIKING PLATES BY MEANS OF METALLIC SHIRTS.

MR. L. CECCONI.

Revue Internationale d'Odontologie January.

When one has to strike up a plate on a model which presents great difficulties by the irregularities which are highly accentuated, and which exposes the gold plate to be torn or to have folds which




prevent a perfect stamping of the plate, the process of metallic shirts ought to be used. For this, red copper is to be procured of three different thicknesses, corresponding to the Nos. 3, 6 and 9 of the French gauge plate. One begins to strike up a plate with the

thickest copper, No. 9, which is more resistant and less liable to produce folds; this constitutes one shirt. A second one is then made with copper No. 6, but this second shirt must be first struck up *over* the No. 9 one; then the No. 6 shirt is placed directly on the zinc and is again struck, then the No. 9 plate is placed on the No. 6, which is on the zinc and again it is struck.

The shirt No. 6 is then on the zinc, while No. 9 is over it. The two first shirts being so disposed, the shirt No. 3 is now stamped by placing it first over the No. 9, then between No. 6 and No. 9, and then, finally, the shirt No. 3 is placed on the zinc, over it is placed the No. 6, and over it all the No. 9; those three are then struck together. The thicker the shirts, the farthest from the zinc they must be placed. Supposing that we wish to strike up a large suction plate formed of two plates, the thinnest of No. 3 thickness and pure gold—pure gold is mentioned because, although more malleable than 18 carat, it is more easily torn.

The pure gold plate is first struck over the superposed three shirts which are on the zinc the shirts have attenuated all the prominent irregularities which offered the difficulty in stamping directly on the zinc. The gold plate having been stamped over the three shirts, is placed between shirt No. 9 and shirt No. 6; another stroke is given, then it is placed between No. 6 and No. 3, and over No. 6 the No. 9 is again placed and struck again. Finally, the gold plate is placed directly on the zinc and all the shirts over it. This will give a perfect plate without the least injury in striking.

## TO PREVENT THE WEAR OF UPPER PLATE BY LOWER FRONT TEETH.

DR. C. L. BOYD.

Items of Interest, November.

When a patient wearing an upper plate has the anterior lower teeth in place, but will not wear a lower plate, the lower teeth often cut out the rubber, exposing the pins of the upper teeth. To prevent this, fit small triangular pieces of gold or aluminum against the lingual surfaces of the upper front teeth. The lower teeth striking against the metal prevents exposure of the pins.

## GOLD CAPPED PORCELAIN FACED TEETH IN PARTIAL GOLD PLATES.

DR. E. J. PERRY, CHICAGO.

Dental Review, January.

He says in partial plates of gold he has been very much bothered in years past about the teeth breaking off. To correct this he makes the teeth, as he would make a dummy in a bridge case. Select porcelain facing, the same as used in bridge work, then select an artificial tooth, for making solid gold cusps. The cusps of natural teeth are so pronounced that they are not practical to use; but take an artificial tooth and produce a solid gold cusp, back up the facing, and grind it to place on the model, and then set it against the gold cusp. Invest it and fill the space behind as you would a dummy, grind again up to the plate and solder; the metal will never break, and it will be a beautiful case. There is no danger of the porcelain breaking off.

## PLASTER, RETARDING OR HASTENING THE SETTING OF.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Dominion Dental Journal, March.

To delay the setting of plaster of Paris, use a little vinegar; borax will also retard its setting. Sugar, salt and sulphate of potash will materially hasten the setting, as well as harden it; marshmallow toughens it. Marble dust, mixed with plaster, prevents its expansion, makes it stronger and better able to withstand heavy pressure, especially good for celluloid work.

## TO PREVENT PLASTER ADHERING TO RUBBER PLATES.

DR. J. G. TEMPLETON, PITTSBURG, PA.

Ohio Dental Journal, January.

Coat the model with a thin solution of water and soap, just before packing the case.

## STRENGTHEN PLASTER TEETH.

In the impressions of teeth that are likely to fracture in separating from the impression, or in handling, stick common tacks or small nails before pouring the plaster.

## VULCANIZING.

Vulcanizing should not be done in water, but in steam. Put something in the bottom of the boiler to raise the flask from the bottom, and pour in a very small quantity of water. A spring used by upholsterers is excellent.

## PUNCHING BACKING FOR TEETH.

B. H. CATCHING, ATLANTA, GA.

Have the pins in the teeth parallel, after the end of the backing is fitted to the plate, or surface it is to be united with, place a thin piece of wax on the side going next to the tooth, set it in place and press the wax against the ends of the pins, remove and punch, letting the punch enter the wax impression of the pins. Punching one hole will not interfere with the imprint in the wax for the other.

## ROCKING PLATES.

DR. E. DOOLITTLE, SARATOGA, N. Y.

The writer says the cause of rocking plate is that when a plaster impression is left too long before pouring it becomes so dry that it warps or bulges in the center. He pours impression at once, and on the model places thin metal, covering the hard palate.

## WOOD ASHES FOR MOLDING.

Zahntecnische Reform.

Wood ashes as a material used for obtaining metal dies is said to give very good results, where a fine sharp impression is desired. The ashes should first be mixed with water to remove all the soluble salts; after that they are dried and sifted, then mixed with liquid charcoal tar (liquor carbonis detergens).

# CLASPED PLATES.

DR. W. G. A. BONWILL, PHILADELPHIA.

International Dental Journal, February.

First, how should a clasp be fitted to the natural crown of a tooth to prevent future caries, and also prevent wear, and of what material and how heavy or light the metal, and how wide and at how many points upon the crown's surface should it touch to insure its steadfastness or security?

The thickness of metal is dependent upon the length of clasp, the width of same, and whether one or more clasps will be used to sustain the plate, or where there has to be very much spring to the clasp in passing over a crown that is very much out of perpendicular.

The metal should be of platinized gold only, without any lining, of pure or twenty-two carat gold soldered on it next to the crown. The metal should be loosely fitted to the crown on the plaster cast and afterwards fitted in the mouth directly upon the tooth and made to touch in at least four places. It should not be struck up to fit accurately every inequality of the surface, nor should pure gold first be fitted to the tooth by burnishing it on and then soldering that to the platinized gold.

If a clasp fits minutely all the surface of the crown it makes of the minute space between the crown and clasp a capillary surface, and keeps the mucous secretions, as well as the fine food, forever in contact and with no space for circulation of saliva. Whereas, if the band touches but a few places on the tooth-crown, it will rest just as firmly if it has been well fitted in the mouth and allowed to take its own position when tried upon the crown.

Capillary power made by surfaces very closely approximated is the surest means of producing caries. Where a space is left the points that do touch are in absolute contact, and, aside from a slight wear on the tooth, the surface cannot decay as when there is an actual and close fitting. If made of fine, soft gold, there would always be danger.

A clasp is not needed to grasp the crown very closely. The width of clasp should be as great as can be made, and to steady the plate without grasping it firmly. This will be a new idea to many.

Next to the clasp in importance is to know where it should be soldered to the plate, and on which side of the crown to allow it to go on and off, where the crown is very much out of perpendicular.

In this lies the principle part of the plan, and upon it depends entirely, or greatly, the success of the operation. The plate may fit perfectly, and also the clasp, but all is vain unless the point is known where to unite the band and plate.

This cannot be done unless a plaster impression is taken of both the clasp and the plate in the mouth, so that the exact relation is obtained. The impression of plaster is now run with plaster and sand and the case soldered. To make the whole thing a perfect development the little gold angular tip must be soldered either to the clasp or the plate to keep the clasp from moving up and down.

It should be made of very heavy platinized gold and fitted to the top of the crown around which the clasp goes, and upon that part of it that will be free from the antagonism of the opposite teeth. The side of the crown should be selected and marked by observations made in the mouth on the first visit. These can be fitted on the plaster cast.

When the impression in plaster has been taken of both clasps and plate, the easier plan will be to pour plaster and sand into it, and it is then exact, all ready for soldering.

Before any teeth are placed on it, by all means try it in the mouth to see if it will go in and out; for unless the impression has held all the pieces in exact apposition, the plate will not go in or be removed easily. A little filing may be needed to help in the adjusting. Frequently, where the tip rests on the grinding-surface of the crown, the latter has to be ground to let it rest firmly, which keeps the plate from anything more than resting in direct contact with the gum. This must be adjusted very accurately, and the plate will act as a saddle on the gum to prevent riding. This rest prevents any changes of position of the clasp on the tooth, and also any chafing on its surfaces. It is an absolute necessity. It is better it should be soldered to the plate than upon the clasp, as there will be more steadiness; but it must not interfere with the spring of the clasp. The drawings will show the best place for them on the tooth-crown. They should be very strong, as the

whole force of mastication falls upon them. Use eighteen-carat solder for every attachment. These tips can rest on either a gold or amalgam filling, or the body of the tooth. If the latter the enamel may be cut to prevent the antagonizing tooth from touching the tip.

Where there is decay upon the tooth to be clasped I prefer to use amalgam containing much gold in it. There need be no fear of galvanic action or shock so long as the clasp is in direct contact with the amalgam.

My long experience with amalgam in these cases assures me that there is no action between these widely dissimilar metals to deteriorate their qualities as preservers of tooth-substance, but the reverse; and the gold amalgam does not discolor to any extent.

I prefer to allow the edge of the filling to stand outside of the clasp, and not rest underneath it at the top or next the grinding-surface, and I do not hesitate to use the corundum wheel upon the enamel where slight projections interfere with a clasp resting securely. No harm can result where the cut surface is polished. If caries should occur at any point thereafter from accumulation of food, I should fill with amalgam. But this need not often result when cleansed after each meal.

As I have already stated, the injury done to the tooth where a clasp is upon it is from the food being allowed to remain for weeks in contact,—never from the clasp where it touches, unless too accurately fitted.

Each case must be thoroughly studied after the plaster cast is made, or the result will not be satisfactory. The points on the clasp and plate where the bar is soldered to connect them are the vital parts, and, unless judiciously chosen and the bar made of platinized gold wire and the base plate of two pieces of gold soldered together to stiffen it, and the clasp of proper width and thickness, the strain placed upon the mechanism will break it. The bar holding the clasp and plate must always be upon the side of the tooth where there will be least resistance. Take a second inferior molar that has tipped forward very much and also inclines to the tongue. Here the soldering should be done as far back on the buccal side of the clasp as can be accomplished. Then the spring of the clasp is not needed for the buccal side, but for the anterior and lingual sides, where projecting from a perpendicular. If sol-

dered from the lingual side, it would be impossible to get the clasp on or off.

In the upper cases it is generally the reverse, although there are many exceptions, and no rigid rules can be laid down. Each one must be especially studied, or no good results. Nor can you rely upon fitting plate and clasp to the plaster-cast and soldering from that,—no, never do it! Take the trouble to take impression of both plate and clasp in the mouth, and then solder from that.

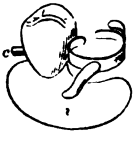
One of the greatest advantages, and one least likely to need repairing, is in the use of English crown-teeth used for rubber, or the tube-tooth for gold plate work. When vulcanized on, or soldered with backing, the grinding surfaces are of porcelain, and are more artistic and sightly. Besides, if needing repair, it can readily be done. But when care is taken to make the plate heavy, and a stiff bar is used to connect plate and clasp, repairs are seldom needed. I prefer the English tooth, where no soldering is needed to attach it to the plate.

Above all else, the operator is clear from such vandalism as is practiced for permanent bridge work, and has infinitely more pride in the result. Spaces can be filled with satisfaction to patients and for less money, and the profits be none the less.

A study of the cuts will give an idea of this work, but it will not appear so clear until it is attempted. The articulation for one or two teeth I do directly in the mouth, but for three or more I prefer my articulator, and put on the minute details after the teeth have been attached.

FIG. 1.

FIG 2



The letters on each cut have reference to the same parts on all. Fig. 1 is a cast for first upper bicuspid, right side. A filling of gold was placed in the distal surface of the natural cuspid with a hole, *c*, drilled into it for the pin *c* in Fig. 2. The second bicuspid had also a large amalgam filling, around which the clasp was placed, so that it would not show from the mouth. Fig. 2 gives the plate with English crown thereon, with pin soldered to the plate. The

clasp has a tip at *h* soldered to it, and *i* is the heavy platinized gold bar, showing how it forms the attachment between plate and clasp, and just where; *c* is a pin, soldered directly to the plate, which enters the hole in the gold filling shown in Fig. 1.

Where no filling is in the cuspid I should use a short clasp fitted near the cervix, to reach from the palatal surface to the buccal, where it would not show from the outside, and soldered on the extreme palatal side to gain a spring.

FIG. 3.

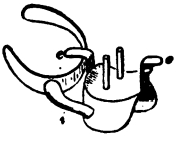


FIG. 4.

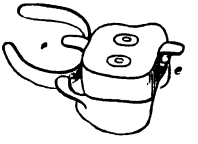


Fig. 3 is the skeleton plate without the crown, which shows clearly the cast for which it was made. (See Fig. 5.) In Fig. 3 is *e*, the tip, resting on the second molar, soldered to the plate. On the plate next to the second bicuspid is soldered an upright with a tip, *e*, and a thin, narrow projection underneath it, which sets in a groove shown at *d* in Fig. 5, in an amalgam filling, to keep the anterior of plate in position and to prevent the plate from pressing too hard upon the gum; *i* is the bar connecting plate and clasp on the lingual side. One or more pins for the crown can be used.

Fig. 4 shows the same, with the crown cemented on with oxyphosphate, or vulcanized, or with gutta-percha.

FIG. 6.

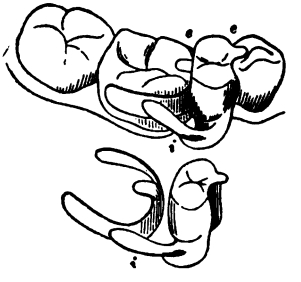


FIG. 5

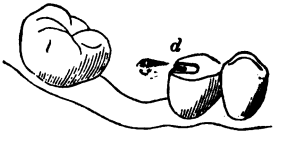



Fig. 5 is a case, left side, lower jaw.

Fig. 6 is a second bicuspid tooth, right side lower jaw. The bar *i* is soldered to the plate and clasp on the buccal side and the tip

on the clasp on the first molar, and, as the crown is made entirely of gold, the tip is soldered directly to it to rest on the first bicuspid, and the anterior surface of the gold crown is made concave to fit into the distal surface of the first bicuspid, which prevents any movement laterally. A gold crown is used, as it is not seen, and facilitates greatly the soldering and adds immensely to the strength, and there is no danger of repairing in the future. The back tip, which rests on the molar, should have been soldered to the crown also, and less strain would come on the clasp.

Fig. 7 is an extreme case of tipping of the third molar, lower jaw, right side. The clasp was soldered to the plate on the buccal surface, and the plate at the second bicuspid was held as in Fig. 4. It could have been done by a narrow clasp to reach only partially around the second bicuspid, where it would not show on buccal side.

Fig. 8 is another extreme case where the second molar in the lower jaw projects towards the tongue and the second bicuspid towards the cheek. In this case the bar should be soldered on the buccal of the molar near its distal proximal surface at *b*, and the second bicuspid on the lingual surface at *a*.

FIG. 7.

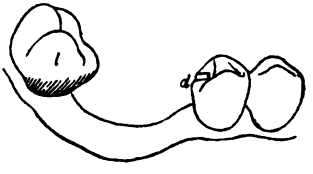
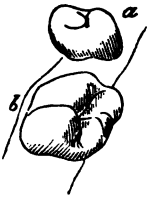


FIG. 8




I cannot urge too strongly the retention of all roots that can be made healthy when no crowns can possibly be placed on them. When allowed to remain, and these plates fitted directly upon them, they become firm and non-irritant, and enable the same pressure to be used on the artificial teeth as on the natural ones, and are clean as any part of the mouth. I seldom remove a root that can be reclaimed. The satisfaction to the patient is immense. The retention of one tooth, either with natural crown or artificial is enough to hold in position a full upper set with a plate very narrow and confined alone to the alveolar border, and with no suction, provided the articulation is perfect.

I can further assure the far more perfect success of these operations if the clasps are made to touch not more than at three or four points on the crown. Where fitted accurately, caries is doubly invited by capillary action.

Not least of all the virtues of this class of operations is that the average dentist in plate work, or even the operator, can learn to successfully do it, when but few can pretend to do a respectable piece of bridging.

## STRENGTHENING TRIAL WAX PLATES.

Zahntecnische Reform.

A method out of the ordinary for strengthening wax trial plates and bases for obtaining the bite, is to insert a piece of perforated aluminum along the ridge upon the wax base plate, and cover with the wax for obtaining the articulation.

# CROWN AND BRIDGE WORK.

## TO PERFECTLY ADJUST THE LOGAN CROWN.

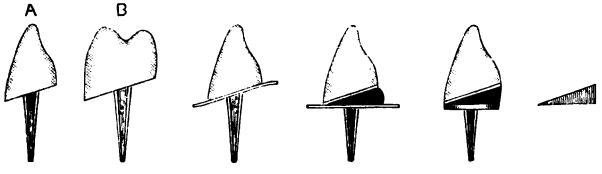
DR. GORDON WHITE, NASHVILLE, TENN.

Dental Cosmos, January.

By making a considerable change in the present form of the Logan crown, as shown in Fig. 1, *a* and *b*, we have a crown that can be adjusted in a few minutes, and with a degree of perfectness not yet obtainable by any crown on the market, nor, within my knowledge, by any so far suggested method.

The manner of making the adjustment is certainly as simple as could be desired.

FIG. 1. FIG. 2. FIG. 3. FIG. 4. FIG. 5.




After preparing the canal for the reception of the Logan pin, select a tooth in the usual way, having regard to correct length, width and color, and if care has been exercised to select one as near the right length as possible, it will only be necessary to touch the buccal or labial point of the neck of the crown a few times with the corundum wheel, and the proper length or bite will be obtained. Next take a disk, or small piece of thin platinum foil, about No. 50, and push through this the pin of the tooth, carrying the disk up against the porcelain, as represented in Fig. 2. With a little drop of Parr's fluxed wax dropped in the triangle, as it were, formed by the backing and the pin, the disk is held securely in place, and the platinum is trimmed around with small scissors, that there may not be any overlapping. Now place around the pin on the platinum a ball of Parr's wax, stick the pin through the second disk of the foil, and rub the platinum with a hot instrument, that the wax and disk may be sealed together, as

shown in Fig. 3. Place this in ice-water to harden the wax, so as to resist pressure. It is now ready to insert, and by pressing the tooth up until the labial surface strikes the end of the root, and having the patient to close the jaws, the correct bite will be secured with the opposite tooth. It will be found on the removal of the crown, that the platinum next the root has been perfectly swaged to the root-end. This second disk is now trimmed according to the outlines of the root. When it is so desired, the palatine side of the root having been left a little high, or just above the gum, the platinum can be split with scissors, lapped, and burnished around the exposed side of the root, to form a partial band (Fig. 4).

After having dried the wax with bibulous paper, and shaped up the approximal sides, these sides are covered with small, triangular pieces of platinum (Fig. 5), by laying the platinum on the wax and rubbing over it a hot burnisher. The crown is now ready to invest, and the investing mixture is poured on a small piece of wire netting, which will prevent its cracking during the soldering operation. The wax having been burned out, this triangular box is filled flush with solder in the usual way and polished. The result is a beautiful and perfect crown, in every respect the most substantial porcelain crown we have.

I frequently make the crown without using the triangular piece of platinum to form the box (Fig. 5), relying on the investment to form the sides. This saves a little time; but it frequently happens, unless care has been taken to make the wax flush, that the approximal surfaces are not well rounded, and consequently do not finish well. It is therefore safer to use the triangular pieces of platinum foil to form the sides of the box as described, before filling with solder. This plan is particularly adaptable to those cases of fracture which have resulted in a rough root-end, and where it is often next to impossible to get them smooth.

Where it is convenient, or if it is desired, the triangular box can be filled with body, and baked in a Parker furnace from six to eight minutes. This gives us an all-porcelain crown which fits perfectly to the end of the root. In this case the first disk next the porcelain is left off entirely.

## SETTING LOGAN CROWNS.

DR. J. D. PATTERSON, KANSAS CITY, MO.

Western Dental Journal, July.

The following method obviates the difficulty of obtaining a perfect joint between the stump of the root and the crown. After sealing the apical opening, grind the root under the free margin of the gum, select the proper tooth, wrap very thin platina plate once around the entire length of the pin and solder with pure gold, then burnish this barrel about the pin. Now prepare the root to receive this barrel, then burnish 32 gauge pure gold over the stump, solder the barrel to the cap, insert barrel and cap, and with a wooden dowel, mallet and burnish cap to a perfect joint with the stump and trim the cap to the periphery.

Remove cap and barrel, and you have the exact surface of the stump out of the mouth, to which you can rapidly grind the tooth to fit. Then cement the barrel and cap to place on the root. We then have the root perfectly protected and a metal wall perfectly fitted to the post and crown. When cement is hard then insert crown to place.

## SETTING LOGAN CROWNS.

DR. S. B. PROVOST, KANSAS CITY, MO.

Dental Review, December.

Grind the tooth so that it approximates a fit, the root is banded, the band ground evenly with the end of the root; remove and fit a disk to the band and solder into place, punch a hole for the admission of the pin of the crown, replace the cap and the crown fitted nicely to the cap; but the posterior or distal part of the crown is ground away so as to leave a wedge-shaped opening, the crown removed and a disk of thin, pure gold is burnished to the end of the crown, a little hard wax is placed over the disk, when the crown is driven into position, the whole removed, invested, and the wedge-shaped opening filled with a high grade of plate or solder. The crown is then finished and set with cement. The crown can be set so that but little, if any, of the band shows.

## SETTING LOGAN CROWNS.

DR. H. S. LOWERY, KANSAS CITY, MO.

Dental Review, December.

The crown is adapted to the root of the tooth, then base-plate gutta-percha is wrapped around the pin and adapted to the crown, the pin and tooth being heated so that the gutta-percha sticks. The root canal is wet with water, to prevent the gutta-percha from sticking. The prepared crown, with gutta-percha in place, is heated in water and pressed to place, repeating the operation, trimming off excess until a perfect fit is secured; then all is made dry, the gutta-percha smeared with chloro-percha, and the crown driven to position with a mallet. The doctor states that he has no trouble from these crowns coming off.

Dr. J. G. Harper says he has found it an advantage in making a close joint in the mouth, to place on the pin a disk of tin plate, then driving the tooth to place; the point of contact is indicated on the disk, and the crown can be ground accordingly.

## FITTING LOGAN CROWNS.

Dr. Freeman paints the end of the root red. The pigment adhering to the crown shows where to grind it with much less trouble than making a cast.

Dr. R. C. Young says: Take an impression of the exposed end of the root after it has been proximately trimmed, and make a cast. Smoke the cast, and on applying the crown you see exactly where it requires grinding.

## PERFECT OCCLUDING GOLD CROWNS.

DR. W. H. WHITSLAR, CLEVELAND, OHIO.

Ohio Dental Journal, January.

Often cases present that irregularity of occlusion which renders the ordinary use of the various dies in the market useless. Among the various expedients in such cases the following may suffice:

Fit the band to root and trim on the occluding edges, with flat file, to line where side walls begin to curve upon occluding surface. Return band to root and fill to overflowing with plaster well mixed so as to set quickly. Have patient close teeth together naturally. When plaster is hard remove band and trim, so as to make presentable surface, retaining the imprint of the occluding cusps. Use this model for making an impression in Mellotte moldine, from which make a fusible metal die. Perfectly adjust to the band the resulting swaged cap and solder and finish.

Another way: Fill band with moldine or plaster and proceed to get bite as before, then insert this model into fusible metal almost cold and drive gold plate into this mold with lead.

## GOLD CROWN.

DR. GORDON WHITE, NASHVILLE, TENN.

Items of Interest, June.

After having made the band and contoured it with pliers, or otherwise, select from a collection of molar dies the die nearest the size of the band, and swage the grinding surface of 22-karat gold, very thin, 34, 35 or 36 gauge, on a block of lead or soft wood. Now stick this to the band with the smallest particle of solder. Trim the cap, particularly proximal sides, so that it will pass readily between the teeth. The band is now placed into position. If force sufficient to bend the grinding surface is required to get the band into position, place under the cap an ordinary foot plugger, and push the band into its place. The patient is directed to close the jaws, and owing to the thinness of the gold grinding surface the impression of the opposing tooth is easily made, thereby securing the correct bite. The crown is now removed. The cap and band are held together by the ordinary soldering pliers, and the cusps are filled with 20- or 18-carat solder, which, of course, unites the band and cap. The crown is now finished in the ordinary way. This is as good a crown as can be made, and recommends itself because it is so quickly made.

# ARTICULATING GOLD CROWNS.

DR. H. W. ARTHUR, PITTSBURG, PA.

Ohio Dental Journal. January.

Great stress is constantly laid on the careful fitting of the band; this is altogether proper, but any bite will do, judging from observation, so that it does not interfere with the occlusion of the other teeth. Apart from the importance to the patient of having the bite restored, which is accomplished by this method, the force is in the right direction, and there is no leverage exerted which has a tendency to loosen the crown and, it may be, expand a well-fitted band.

Having the band fitted and not interfering with the occlusion of the teeth, the bite is taken, preferably with modeling composition, which can be hardened with cold water while in the mouth, so that the band can be replaced exactly, should it not draw out with the impression. When in the articulator it should be an exact working bite. Place sufficient wax in the band, now in the articulator, and close; this will give the bite in the wax; trim to the band, and give such artistic shape as desired, being careful to leave the bite proper intact. Remove from the articulator (this, by the way, can be done more readily if the band be filled with wax, leaving only a slight rim, before placing in the articulator). Take rubber hose about an inch in length and the same in diameter, obstruct the lower half, mix and fill the upper half with Teague's impression compound, while in a creamy state, and imbed the wax bite until it slightly covers the band. If the depression in the bite is deep, it may be well to place a little of the compound in it first, to avoid having an air space. When set, the band and wax bite is removed, and the compound thoroughly dried. This can be quickly done by putting it into a melting-ladle. A change of shade all over will indicate that the moisture has been driven off. Using the rubber ring, dies are made of fusible metal. These should be exact and well defined.

A piece of thin, pure gold plate, of sufficient size, is pressed by the fingers, and burnished on the male die, the corners clipped, ends folded in and the sides over, to prevent drawing the gold over the cusps. Strike up once on the dies, and trim off the surplus with scissors. Place all the parts in the articulator, gold cap

bite over the wax bite, close the articulator with slight pressure, burnish the cap down around the band and make sure that it is exactly in place. A trifle of flux wax may be placed where the cap and band meet. Invest, allowing the investment to touch the band at one or more points, so that should it be displaced when the wax is being removed from the inside, it may be exactly replaced. Solder and finish.

Any slight error in manipulation can be noted by placing in the articulator and can be corrected before placing it in the mouth.

## GOLD CROWN.

DR. C. E. KELLS, JR., NEW ORLEANS.

Items of Interest, August.

The band is fitted to the root and cut down till it just clears the opposing tooth or teeth, and contoured to a greater or lesser degree of satisfaction (usually lesser, to be honest about it). It is then placed "home" on the root, filled up with wax, when necessary, and an impression of that side of the arch is taken in plaster. An impression of the same side of the opposite jaw is then taken and the casts mounted on an articulator. The articulating surface of the crown can then be artistically carved up in pink paraffine and wax (preferably), the result being a perfect articulation with the opposing teeth. Fusible metal dies are then made, and the cap struck up in pure gold of from thirty-three to thirty-five gauge. This cap should telescope slightly over the band, which allows this portion to be crimped in, so that it may be held securely in its exact position on the band for soldering.

In this manner a most artistic and beautiful articulation is always obtainable; there is no stereotype surface, and the result always repays one for the time consumed.

## ARTICULATING GOLD CROWNS.

DR. J. S. THOMPSON, ATLANTA, GA.

When he has a perfect fit for the band he places it on the root and fills it up high with wax, letting the patient bite down into it.

This gives the exact articulation. Trim the wax and make a duplicate in Mellotte's metal, using a sand mold; swage up the cusps and trim it to fit accurately. Turn the open end of the band up and the cusps down, and tack it to the top of the crown. With a sharp knife, trim off all the gold except one point to hold it by. Catch it with pliers, holding the hollow end up, and you can put all the solder you choose in the cusps. The solder will always flow to the hottest part, and it won't run up hill.

## CAP FOR BRIDGE ABUTMENT.

DR. L. G. NOEL, NASHVILLE, TENN.

Dental Headlight, January.

For clearness we will suppose that you have a case where a patient has lost the second bicuspid, first molar and second molar. Here you have the first bicuspid and wisdom tooth for abutments. We will suppose that both of these teeth have good antagonists. With suitable corundum disks and stones, cut off the bulging parts of these teeth until they are reduced to nearly straight lines.

Do not cut the grinding or antagonizing surfaces, for reasons presently shown.

Measuring from grinding surface to gum line at deepest points, cut strips of crown gold plate wide enough to make a band in the usual way; perhaps allowing extra width so as to drive on, and, after adjusting with files and stones to the gum line, may have enough to strike off with a stump corundum wheel to a level with the masticating surface.

Having fitted a band, get a correct adaptation of gold to the masticating surface, so that cap may be so closed as to protect the cement from washing out. Take a small piece of pure gold plate—same thickness as that used for the band—and, first annealing to soften, burnish it into the sulci, as perfectly as can, bending down over band and marking, so can put the two together accurately after removing from the tooth. Now remove and catch the cap to the band with some little bits of solder, placed upon the outside. In doing this it is not necessary to try to close all the openings. Then replace it upon the tooth and have the patient bite it to an accurate adjustment. Remove it and place a quantity of solder clippings—

18 carat preferred—into the cusps upon the inside of the crown, filling it over level to a thickness to withstand wear in mastication. When returned to the tooth, the crown will be too long. This is corrected by grinding away enough of the masticating surface to let the border of the band under the free edge of the gum, as originally fitted. When both crowns have been finished in this way take the impression and complete the bridge as usual.

## AMALGAM CROWNS.

DR. W. H. STEELE, FOREST CITY, IOWA.

Dental Tribune.

Sometimes we find badly decayed molar roots that will hardly warrant the expense of a gold crown; such teeth can be made to do good service for years, by the following plan: Prepare the canals as carefully as for any crown; firmly anchor two good platinum posts (with good cement) in the roots, having them long enough so they will extend to within one-sixteenth inch of the articulating surface of crown. Now fit to the roots a thin platinum band, which should be wide enough on the buccal portion to reach above the posts. Next, before the band is permanently adjusted, solder to it a — shaped bar, just long enough so the cross arm will reach over and embrace the root posts; solder to the inside of the band. If the decay should extend lower in some places than can be covered by the band it will do no harm, but be sure such places are thoroughly filled with alloy, and in finishing be careful that they are left perfectly smooth. When the alloy has set dismiss the patient, with a request to call again; when the crown should be nicely smoothed, burnished and polished. This entire operation can be completed at the chair, and such crowns will make strong, serviceable masticators for years.

## DAVIS CROWN.

DR S. DAVIS, DENVER, COL.

International Dental Journal, August.

A platina band is formed which encompasses the end of a prepared root. After adjustment with the dowel in socket and

band in place, a common plate tooth is carefully arranged and secured to band and dowel by means of wax, when the whole structure is removed and invested. After crystallization the wax is removed, and a low flowing grade of body is easily melted over the palatal surface of the tooth, incorporating the pins in the tooth, the end of the dowel passing down by the pins, the palatal cap, and the band.

After cooling, the investment is removed and the band covered with gum-colored body and beautifully flowed, so that when the combined tooth, band and dowel is adjusted on the root no defect in the gingival border can be easily detected.

## CROWNS.

DR. J. F. STEPHAN, CLEVELAND, OHIO.

Ohio Dental Journal, July.

We fail to make perfect crowns inasmuch as we fail to properly fit the root and contour the crown. In order to properly fit a root, the enamel mast be removed, or at least the sides must be cut parallel. The root being prepared, a measure is taken with silver suture wire, burnished into every depression and carefully removed. With knife and file a wooden form is cut, preferably of hickory, to fit this measure, which, when finished, will be exactly the shape of the root. The wire is cut, the band made and carefully fitted to the wooden form. A band made in this way must necessarily fit the root when carried to the mouth. We are able to use pure gold for the ferrule or band, by using these wooden forms, for, if it should be bent during manipulation, it is carried to the form and again given the proper shape. It can be given an extra stiffness by burnishing while on the form. If the band is placed upon a wooden form or mandrel and the thumb is placed firmly against it, the band will be contracted by burnishing toward the thumb. None but pure gold will admit of this treatment. As pure gold is so easily adapted to the irregularities of a root, this method of fitting is very desirable. The band is now adjusted to the root, trimmed to conform with the curve of the gum and to receive the antagonizing cusp. Give it the proper contour, with contour pliers or anvil, so as to preserve the interproximate spaces.

The root of any one of the six anterior teeth is dressed in conformity with the curved border of the gum, the labial edge slightly beneath the gum, while the palatine may be cut only to the palatine prominence.

After the enamel has been removed and the wooden form made as before, the band is cut so that when in place upon the root it shall extend one-half the length of the required crown. Mark a scallop upon the labial side, extending even with the gum and on the lingual even with the end of the root. Cut these out, replace the band upon the root, and dress down with a corundum wheel, until the labial edge is a little below the gum margin. The proximate extensions are left to fall along the sides of the porcelain front, to give it extra strength. A piece of thin platina is bent into and soldered to this curved surface, the surplus trimmed off and the band finished.

You now have a band that offers the strongest possible attachment to the root, and is hidden from sight when properly fitted with a porcelain front. It can be easily and successfully used as a base for the Richmond, Ash, Case and Logan crowns. When placed on the root the labial border should pass just below the border of the gum. The root is prepared for the pin or screw; a hole punched in the cap and the cap and pin placed in position. An impression and bite is now taken and the antagonizing models made. The bite may be taken in modeling compound which gives a clear outline, and lessens the liability of its bending out of shape. The patient is instructed to press the tongue against the compound, while with the finger you press it to its place. The proper porcelain facing is selected, ground to place, backed and soldered to its proper position.

Do not leave overhanging edges to catch food, but dress the porcelain down even with the band and polish. If you desire to make a crown of the Ash & Son's tube tooth, the proper porcelain is selected and carefully ground to the curved surface of the band. While in position mark and cut the hole for the post. Place the cap upon the root, and bore through this hole into the canal. Put the post into place, bending it if necessary, so that the tooth takes its proper position. Take an impression in plaster and solder the cap and post together. Refit the porcelain, roughen the surface of the cap and lute the whole together with jeweler's hard

white enamel. Invest, fuse the enamel and finish. This makes a most beautiful and easily constructed crown. If the jeweler's white enamel is finely pulverized, and mixed properly with water, when laid over a crevice with a wooden toothpick or camel's hair brush, it will pass into the smallest space.

In the construction of porcelain front bicuspids and molars, the measure is taken and wooden form made, as in the all-gold crown. The root should be cut as for the anterior teeth, and the curve reproduced on the wooden model. The gold is cut the same as for the Richmond all-gold crown. By the aid of the wooden form you are able to mark a flap, which, when partially cut, curved to fit the curve of the root, and turned in upon the model, its sides will touch the proximate sides of the band, to which it is ultimately soldered. The flap should extend on the face of the root only so far as the backing of the porcelain face. The band is adjusted to the root, and an impression and bite taken. Antagonizing models are made, the porcelain face ground to place, backed, and, if sure of the alignment, is soldered to its position.

In this process the porcelain should be invested and the soldering done through the loop made by the band. The band is again placed upon the antagonizing model, and the cusps fitted. The whole is then invested, soldered and finished. In this crown there are no large spaces filled with solder. The solder is only used to close mechanically the fitted joints. The post need not be soldered to the crown, but may be anchored in the palatine canal.

These crowns being similar in construction to those for the anterior teeth complete a system, which lessens the bewildering variety of methods practiced to-day.

## TEMPORARY CROWN.

DR. J. F. SIMPSON, TRENTON, CAN.

International Dental Journal, January.

Grind broken stump of natural tooth down to near gum border; take a plate tooth that suits the space, and for a post, a stiff piece of roughened wire flattened at one end; at flattened end, file two small notches in opposite edges, for the pins of the tooth to be bent into to hold the wire firm; this makes the crown,

and can be set with gutta-percha or absorbent cotton wrapped about the wire and put up the root canal; the swelling of the cotton holds it firm in the root, and can be easily removed and reset each time we have to treat the root.

## ENGLISH TUBE TEETH IN CROWN WORK.

DR. JOHN GIRDWOOD, EDINBURGH, SCOTLAND.

Dominion Dental Journal, October.

The root is prepared in the usual manner. If part of it remain above the level of the gum, apply the rubber dam to one tooth on each side before excising, having first anesthetized the gum by painting on a twenty per cent. solution of cocaine. If possible use a ligature in preference to a clamp for fixing the rubber, because the latter interferes with the bite when the pin comes to be adjusted. Push the rubber up as far as you can, for the reason that it is well to have the union of root and crown covered by the gum when the dam is taken off. Now drill the canal with a twist drill a shade larger than the diameter of the wire to be used as a post. If, as often happens in the first bicuspid, the canal be bifid, a piece of wire may be bent to fit into each canal, and to it the straight post should be soldered, or the straight pin may be "kneed" and an additional "leg" soldered to it. The post may be made of gold, platinum or English dental alloy; the last I prefer. The post, where possible, should have a fine shallow thread cut on it, except where it emerges from the root to enter the crown. This part should not be impaired in strength even by a screw-thread.

Having selected a suitable tooth, fit it roughly to the root. Place the pin in the root and try on the crown; if it be much out of line with the other teeth, this fault must be put right, by bending the pin or by reaming the canal in the direction necessary, or by a combination of both operations. Now try on the tooth and the pin once more; if everything is right groove the walls of the canal with a wheel-bur, mix the cement, and, placing a little in the canal and round the pin, force the latter to place with the pliers. While the cement is yet soft take the crown and slightly oil its base; slip it on to the pin, and before the cement sets insure its right position. It had best be held in place till the cement has set.

Now, having taken off the crown, trim away the surplus cement from the face of the root. The face of the root may be cut out round the post, and filled with gold or amalgam, if thought desirable. Make the patient close his teeth, and grind the post till it is clear. Now fit the tooth on the root as you would to a plate, but instead of using vermilion paint for fine fitting use a small disk of thinnest articulating paper, and grind off where the tooth is marked by it till a perfect fit is obtained. Next grind to fit the bite margin, remove the excess of porcelain till the sides of root and crown are continuous, and polish. Previous to setting, hollow out the base of the crown, avoiding the edges; this provides for the presence of a body of cement between the root and the crown, as in the Logan and other crowns. Clean out the tube thoroughly and roughen its interior as in plate-work, and fix it with cement, pressing it firmly to place with a Bonwill crown-setter. The head of the pin may be riveted with an engine-burnisher, but do not omit to examine the bite before the patient leaves.

The shaping of the root is a matter of choice. The two which I have found best are the "saddle" and the well known "New Richmond" shapes. The crown to suit the latter is best fine-fitted by hand, with a three sided corundum file.

### TUBE CROWNS ON METALLIC CAPS.

If for any reason it is considered advantageous to protect the surface of the root by means of a metallic cap and band, the rubber dam must be dispensed with. Trim the root, making the sides parallel, and, after fitting a collar to it, leaving the gold a trifle high, prepare the canal and insert a post loosely. Next take a plaster impression and bite of the whole; the pin and band will either come away with it or, should they not do so, they can be easily replaced. Cast and open; fit a coin gold cap, No. 30 thickness, and having soldered it to the band, through it drill or punch a hole for the pin; next place it on the model, insert the pin, and, when needed, correct its direction by bending before soldering to the cap. (The pin will be easily bent if nicked with a file, and as this weakness is repaired by the soldering, it in no way imperils the soundness of thepost).

Having boiled in pickle, replace the united pin, cap and band on the model, and proceed to fit the crown. This done, cement it

to cap and pin before inserting them in the mouth. This makes a strong and beautiful crown, and while it is applicable to single-rooted teeth, it may be employed on some molars.

### TUBE CROWNS ON LIVING TEETH.

It is seldom that tube teeth can be used for this purpose, but two cases have lately been treated by me with great success. The first of these was a lower left first bicuspid, which had a large amalgam filling, extending to the crown, on each of its approximal surfaces. The tooth was much discolored, and by its presence the looks of a good set of teeth was spoiled. The patient objected to having the nerve drilled into and killed, the more when, on removing the discolored crown, calcification of the pulp was discovered. It was decided to grind down the buccal aspect of the root nearly to the gum-margin, leaving the lingual side considerably higher. A cap and band was made to fit the root tightly and pass a short distance under the gum; a pin was soldered to this, a tube tooth adjusted to it and the bite, and the whole cemented on the living root. This device has been worn for two years, and bids fair to last twenty. The buccal side of the twenty-two-carat gold band is almost covered by the gum, and what of it is seen looks like a tiny cervical filling. The second case thus treated does not differ essentially from this one.

## BAND-AMALGAM CROWNS.

DR. J. W. FOREMAN, ASHEVILLE, N. C.

Dental Cosmos, June.

Reduce crown to within about a line of gum-margin; the sides to parallels as low as the free margin of the gum will permit. Measure accurately, by burnishing a strip of thin sheet-tin around the stump. Measure the distance from the point where you wish the band to stop under the gum to points of cusps of antagonizing teeth with the mouth closed, with a pair of caliper-tweezers for length of band when soldered. Mark the distance between the points of caliper-tweezers, and also the length of the measure, on twenty-two carat gold plate. Cut the ends of the gold strip slanting, so that the top may be larger and the bottom smaller than the

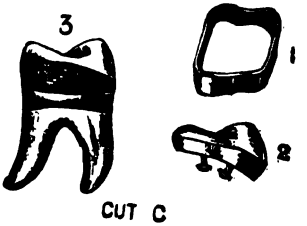
stump measurement when the band is soldered, that it may have a better shape and drive on tight. Shape the small end to correspond with festoons of gum, bevel and polish. Now bevel the stump freely from near the gum-line, all around; spring the band over the end of the stump and drive to place, turn the edges, buccal and lingual, in, with How's curved pliers, supporting the opposite side with fingers; see that it does not interfere with occlusion anywhere; if it should interfere, grind off till free, supporting the band to prevent displacement; dry out and fill with amalgam from the bottom of the pulp-chamber to a little beyond the line of occlusion, packing the amalgam thoroughly with a thin instrument between the beveled edges of the stump and the band. Next day shape up grinding surface with disks and burs, and polish, burnishing the band-edge carefully under the gum.

## RUBBER PORCELAIN CROWN.

DR. W. H. STEELE, FOREST CITY, IOWA.

Ohio Dental Journal, August.

For purpose of illustration, we will take a lower molar. When the canals have been properly cleansed and prepared, trim and shape the root as for any other band crown. Then take measurement with binding wire, and make a narrow gold or platinum




CUT C

band. (Fig. 1, cut C.) Adjust the band to the tooth; it should be a good close fit and extend just below the free margin of the gum. Fill the band with wax, keep it dry and take a bite. In removing the bite, the band should come away with it; but if it does not, replace in its position in the wax, and mount in the articulator in such a way as to retain the band in place after the wax

bite is removed. When the plaster sets, warm and remove wax. With base-plate wax for the body, and a porcelain cusp (Fig. 2) for the articulating surface, build a perfect crown. When shaped to suit, take the model carefully from the articulator, being careful to keep all in proper position. Flask the model, so it will open, with porcelain cusp in one-half of flask, and band in the other; wash out the wax and pack with Ash-white, or the pure uncolored rubber, and vulcanize. This crown can be mounted either with posts fixed in the roots, or with posts vulcanized in the crown. If the former, set the posts in the roots permanently, and with a bur cut a place in the rubber crown to receive them, and mount with cement as usual. If to be mounted with fixed posts, the posts should be placed in position, removed with bite and band; flasked and vulcanized in the crown. Fig. 3 shows the crown complete and mounted.

## IMPRESSIONS FOR CROWN WORK.

DR. G. S. STAPLES, SHERMAN, TEXAS.

Western Dental Journal, September.

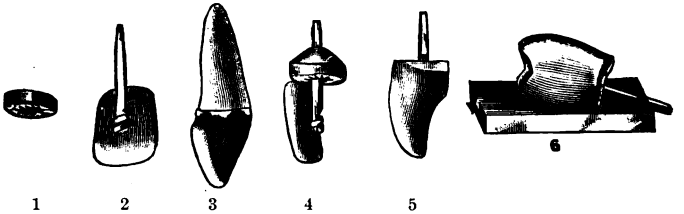
Most men imagine they get a very good adaptation of bands under the free margin of the gum but it would surprise anyone who will first adapt the band to the root in the mouth as is usually done, then take an impression of the root (as I do) and get a metal cast and try them, and see how far from an adaptation it is. The way to proceed is: Take No. 3 modeling compound or No. 2 that has been used a few times, and with Mellotte's No. 20 impression-cup, with the bottom cut out so as to insert a finger, proceed to take an impression. Trim the root to the proper shape, and if there is a tooth on each side, place a small piece of celluloid (a piece of collar, for instance) between the root and the tooth or teeth; then fill the cup level full with the heated compound and press to place; then with ice water cool outer edges, and while holding cup steady, press the compound in center of cup with the finger or a round instrument; cool thoroughly with ice water; withdraw when you have a most perfect impression of the root as far up as the free margin of the gum extends. Dip impression in ice water, have some Mellotte's metal ready, wipe the impression perfectly dry and

dust with soapstone, slip on rubber ring and pour metal as cold as it will flow. Have a syringe full of ice water ready, and as soon as the metal is poured throw on ice water with syringe till you can drop it into ice water, when you will find you have the most perfect cast-metal that can be made. You can then adapt the crown or band to the cast so that when adjusted it will be the most complete adaptation, and so do away with the annoyance and pain to the patient.

## THE DOWNIE CROWN.

BY J. H. DOWNIE, DETROIT, MICH.

Dress up the root even with the gums and prepare it in the usual manner for crowning. Take measure of root with No. 28 wire, cut and straighten wire. Take a strip of platinum of sufficient width for band, lay wire on platinum and mark length. Cut band one thirty-second longer than the mark, bevel both ends, lap to mark and solder with pure gold. Fit band to root, letting it extend nicely under the free margin of the gum, and down beyond the surface of



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root about as much as it extends above. Remove band and clip out V shaped cuts all around, which, when the band is replaced in position, will allow the points to be bent down over root. The band will then appear as in Fig. 1. Select plate tooth, take square iridioplatinum wire of sufficient size for post, taper one end and flatten the other with hammer a little wider than space between pins of tooth, file notch in each side, and, placing between pins, bend them over as in Fig. 2. If the bite is close, grind pins down to give room. After fitting tooth to position, by bending post, if necessary, or grinding base of tooth, put napkin in the mouth, dry root and adjacent parts, and warming a small pellet of sticky wax, place it on end of root and shove post through it and shove tooth

up to position. Press wax up against back of tooth and see that the articulation is correct.

Figure 3 shows tooth set on root with wax backing. Carefully remove by loosening band around with hoe-shaped excavator. Remove wax from around post where it has drawn down into the canal. Mix silex and plaster, in the proportion of two parts plaster to three parts silex, and fill the band with the investment, building up slightly around post. After investment sets, boil out wax.

Figure 4 shows tooth with investment in band and wax removed. Back up with porcelain body and put in furnace and fuse. Add on more body, building up over band on the anterior surface, to conceal band, and fuse again. We now have a finished crown, as in Fig. 5.

In baking, the crown is placed in the tray of furnace, as shown in Fig. 6, putting post through hole in back end of tray, face up. This prevents the tooth being fused onto tray, as it rests only on the back of the band, being held up by the post, and the body not being built up over the posterior part of band.

Ordinary teeth for vulcanite work can be used in making this crown if desired. When they are used the post should be soldered between pins with pure gold.

In the case of bicuspids and molars, especially where the bite is short, it is often better to build them up entire with body, not using any tooth or facing.

## FITTING GOLD BANDS.

DR. V. FISCHER.

Dental Review, February.

After shaping end of root take the measure with a loop of fine wire held in pin vise and twisted until tight, remove and slip it down on an old mirror handle or other tapering, elongated, conical shaped piece of wood or iron, working it carefully as far as it will go; mark its position by scratch with a knife passing around; remove it, cut open, straighten ends, cut strip of gold slightly shorter, bend around and solder to form band, and slip band down on the stick or mandrel. It should be found a trifle smaller than the circumference at the mark. If larger it will of course be nec-

essary to cut open and shorten it. If much too small, slip over end of your small anvil or handle of some instrument, plugger for instance, and tap carefully with riveting hammer until stretched to desired size. Use gold 29 gauge, 22k, and cut the strip from one-half to one line short, thus always permitting a little hammering to stretch band to required size. The band when complete to fit to root should reach just above the mark, never quite to it, or past it, to allow for stretching of wire in removing it from root and slipping on to the mandrel, and will almost always be found to fit at once, and tightly, thus saving your patient the annoyance and pain of repeated trials, and yourself a considerable amount of time.

## SOLDERING BROKEN BRIDGE IN THE MOUTH.

MR. H. BALDWIN.

Dental Record, April.

Back the new facing with thin backing and cover the surface of it with soft solder. Dry the backing in the mouth from which the facing was broken, and with a small soldering iron carefully coat it with soft solder. Keep everything dry and the mouth protected. Place on the new facing, and with the soldering iron hot and a small quantity of solder on it, touch the junction of the two backings and the solder will unite the two.

## A SMALL BRIDGE TO CORRECT AN IRREGULARITY.

DR. NAAMAN H. KEYSER, GERMANTOWN, PA.

Dental Cosmos, March.

I have recently constructed and inserted, with very satisfactory result, a small bridge to correct an irregularity in the mouth of a young lady whose left upper lateral had not erupted. In consequence of this non-eruption the cuspid had greatly changed its position, leaning forward and outward, and in addition was disfigured by a large and conspicuous gold filling, presenting an unsightly ap-

pearance, as shown in Fig. 1. For several years she had worn a small suction plate, carrying a tooth that occupied the space between cuspid and bicuspid. This she was anxious to dispense with, and also, if possible, to improve the general appearance of the anterior teeth. To accomplish this the following plan was adopted: The cuspid was prepared as for crowning, leaving as much as possible of the palatal portion standing, and yet allowing sufficient space to accommodate the pins of the artificial teeth. The labial portion was cut slightly below the gum-margin, as is usual in such cases. Into the root was inserted a strong platinum pin; a collar of the same material was adjusted around the palatal portion, and an impression taken with

FIG. 1.

FIG. 2.

both in place. With the cast thus obtained a piece of platinum was carefully fitted to cover the entire top of the root. This, with the pin and collar properly adjusted to each other to form a cap, was then soldered together with pure gold, using as little of the latter as possible and soldering with a high heat, thinking thereby to more thoroughly unite the metals and thus raise the fusing-point of the gold, and lessen the liability of disarrangement in subsequent manipulation. The teeth, a lateral and a cuspid, were then arranged and adjusted in the mouth, and afterward soldered in the usual way, using platinum throughout and soldering with pure gold only. In order to cover the portion of platinum cap showing between the teeth, I roughened the platinum and then placed upon it a small portion of continuous-gum body, covering this with a little gum-enamel. It was then carefully fired in a continuous-gum furnace. The fixture was now ready for the mouth, and was secured

in position with gutta-percha. When in position its appearance was all that could be desired (see Fig. 2), the small portion of porcelain gum between the two teeth matching the natural gum in color, nicely blending with it and presenting a very natural appearance.

## REMOVABLE BRIDGE.

DR. J. M. EDMUNDS.

New York Dental College Record.

The preparation of the teeth is most important. It is so in all crown and bridge work, particularly so in removable bridge work.

Special care must be taken that the tooth or root is slightly conical in shape from the neck to the grinding surface. Enough of the grinding surface is removed to permit the insertion of two caps. After the tooth has been shaped a strip of copper thirty-four U. S. standard gauge, a little wider than the tooth, may be placed around the prepared tooth, which may be tightly drawn into place with a pair of flat nose pliers. The copper is removed and trimmed to the marks indicated by the pliers, which will give the requisite size of the gold plate to make the ferrule or band. The next step is to force the ferrule over the tooth, pressing and burnishing as necessary to properly adapt the ferrule to the form of the tooth.

When the ferrule has reached the gum the encroachment of its square edges will be indicated by a change of color in the tissue from pink to white. Now mark the ferrule with an excavator around the festoon of the gum. Remove the ferrule and trim to where it is marked. The edges should be filed and burnished before replacing it. This process must be continued until every part of the tooth is neatly covered and slightly extending under the free margin of the gum. The edges must be beveled and burnished so there are no rough, irritating points or edges remaining.

A neat impression may be taken by placing a small piece of wax on the grinding surface, pressing it firmly into place and allowing it to remain until cool. Then with a scaler or other suitable instrument remove the ferrule and wax together. Run the ferrule full of plaster and marble dust, cover it completely, except the wax, which can be removed as soon as the plaster is set.

After the wax is removed make a paper pattern by pressing a piece of paper over the imbedded ferrule, cutting it out as indicated by the impressed line. A piece of platinum foil is cut to this pattern and pressed into the open end of the ferrule, which may have sufficient 18 carat gold solder flown over it to make a cap.

This completed, the cap is ready to be finished and cemented to the prepared tooth. Another cap is now to be made to telescope over the one in position. The ferrule first being made, not quite extending to the gum. It must project at least one thirty-second of an inch above the surface. The wax may be used as previously directed, differing only in having the patient close his teeth upon the wax, thus securing an impression of the antagonizing molars or bicuspids. From this impression run a plaster model, which can be duplicated in sand, and cast in zinc, making a die to strike up the cusps, for the movable or outside ferrule. I find many advantages in making cusps in this way, from very thin 22 carat gold plate. After swaging the cusps and trimming them to fit the ferrule 20 carat solder may be flown in the depression of the under side, making them solid. The cusps are then to be soldered to the ferrule, making a beautiful cap. One of the greatest advantages of this method of making cusps is that an operator can secure more perfect occlusion of the teeth than can be obtained in any other way. Because if the cusps are made from an impression of an antagonizing tooth, they are a fac simile of the natural organs, and will perfectly articulate with the same. The details of this operation must be followed out with other teeth selected for attachment.

Supposing that two teeth, a right superior third molar and a right superior first bicuspid, were capped and crowns made to telescope as above described, the crowns should be then placed over the caps, care being taken that proper occlusion had been obtained. An impression should be taken in the following manner: Mix the plaster to about the consistency of putty, pack this well around the crown and fill the spaces between them well. Now have the patient close the mouth, observing that the proper articulation has been secured. By these means the bite and impression is taken at the same time. After the plaster has set, request the patient to open the mouth, which will generally break the impression. This is most always done. The pieces are then laid carefully aside until

dry, when they may be put together with silex or wax, at the option of the operator. The impression should now be varnished with shellac varnish (the formula is, gum shellac 3 oz., alcohol 1 pint). This makes a thick varnish, which is well adapted to this work. As the impression is now put together with the gold crowns imbedded in it and varnished, the next step is to place it in the articulator, mixing the plaster medium and filling both sides at once, which makes an excellent model to work on. Next grind and fit the selected crowns to the model. Also grind the cusps off, leaving a flat surface, and back them with platinum foil, allowing the foil to extend over the flat surface of the crown about one-eighth of an inch. Now wax these to the gold crowns with hard wax and place the gold cusps, made in the manner described, in proper position over the porcelain facings, in such a manner as to secure perfect occlusion between the gold cusps and the cusps of the natural teeth. This being completed, the piece may be removed from the articulator and imbedded in a matrix made by mixing one part of plaster to two parts of marble dust. Then as soon as this sets the wax can be removed and the matrix filled with 20 carat solder and covered with a piece of charcoal, that it may cool slowly.

After it is cooled it is ready for finishing and insertion. The advantages of this method will be readily appreciated by those who take into consideration the cleanliness and accessibility of the piece in case of accident when repair is needed.

## PORCELAIN INLAYS, LOW FUSING ENAMEL.

DR. BARLOW.

Dental Review, April.

Dr. Barlow only claims the utility of this for the anterior teeth. The cavities that take most kindly to this operation are those of approximate surfaces, keeping away from the cutting edge. Opening into the cavity from the front face he takes No. 50 gold foil and presses it accurately into the bottom of the cavity, and takes a piece of cotton on the pliers and presses that into the cavity, relying on an accurate fit to the orifice of the cavity only. Then he fills with this low fusion enamel—Timme's—and melts over a common alcohol lamp. He then adapts it to the cavity, and sometimes it takes

two or three fusions to get the proper contour. Deep undercuts should be avoided in the preparation. Then, after he gets this adapted accurately he sets in cement sometimes, but prefers the common white gutta-percha to the cement, being tougher. Then he leaves this matrix of gold in there, and burnishes that down after he has pressed it into place. When he gets it all right to set, he makes some undercuts so as to add to the strength and anchorage of the enamel. With that all right he heats the gutta-percha to such a consistency that it will press into place easily, and then burnishes the gold and all down onto the orifice of the cavity.

## FUSING PORCELAIN FACING TO BACKING AND CAP.

DR. C. G. MYERS, GALVESTON, TEXAS.

Dental Cosmos, September.

The great objections to porcelain-faced crowns have been, in the past, the liability of the facing to fracture and lack of cleanliness. To overcome these defects I have succeeded in fusing in the porcelain facing to the backing and also to the cap at the time of soldering.

The material employed is the white enamel used by jewelers in ornamenting gold. This comes in lumps almost as hard as flint, and is reduced to an impalpable powder by grinding in water in an agate mortar and afterward washing thoroughly. After fitting the thin pure gold backing as accurately as possible to the facing, remove backing, and with a fine-pointed brush place a small quantity of the enamel, mixed with water to the consistency of cream, on back of the facing, but do not let it come in contact with the pins. Replace the backing, and bend pins slightly to hold it in place. Then place facing on asbestos, and flow up backing with solder. The heat required to flow solder will also flow the enamel, forming a perfect union between porcelain and gold. In like manner the enamel may be used to fill space between facing and cap, and when soldered it will form a perfectly cleanly as well as strong piece of work.

The enamel can also be used in gold plate-work when the teeth

are to be soldered to plate, thereby doing away with the uncleanly joints so often found. By removing the objectionable features of work we thereby widen its scope.

## HOLDFAST FOR PORCELAIN INLAYS.

DR. D. GENESE, BALTIMORE, MD.

Ohio Dental Journal, February.

Get the impression of the cavity and edges with number 30 to 60 gold foil; when thoroughly fitted fill with hard wax, heat by spatula, and press to fit tightly. Remove and invest in Teague's compound as lightly as possible. When dry burn out the wax by laying the imprint wax down on a piece of plaster to absorb the wax as melted; this leaves a true mold of the cavity and edges and no force to displace the mold. (No need to have the investment outside the gold overlap.) Now take some waste gold foil, roll it up to form a pellet that will lay inside the cavity about one-half depth. Put the porcelain or glass mixture in quite wet and press and dry with bibulous paper, then burn it in the usual way each firing until perfectly formed and full enough. It should be a little below absolute fusing point or enough to thoroughly shrink the porcelain without vitrifying it until the last layer. Upon removing the investment and peeling off the gold, the little pellet can be picked out, and a nice depression, with undercut edges, will be formed for the cement to enter and firmly hold the inlay in place.

## PYROZONE FOR CROWN AND BRIDGE ABUTMENTS.

DR. E. C. KIRK, PHILADELPHIA.

Dental Cosmos, November.

A useful application of hydrogen-dioxide solutions which has given much satisfaction is in the treatment of root-abutments for crown or bridge-work. An application of ethereal pyrozone to the root and gum-margin, just before adjusting the crown or bridge, not only absolutely cleanses the parts from adherent mucus or blood-

serum, but completely seals the surface of the marginal mucous membrane, so that there is no oozing or weeping of fluid from the membrane to interfere with the adhesion and setting of the cement. The pyrozone must of course be applied only to the gingival margin, but in such quantity to blanch the tissue to the extent of a narrow band around the root-end.

## METHOD OF SAVING OLD MOLARS WHEN THEY ARE TOO FAR GONE FOR THE ORDINARY CROWN.

DR. CHAS. K. VAN VLECK, HUDSON, N. Y.

Dental Cosmos, April.

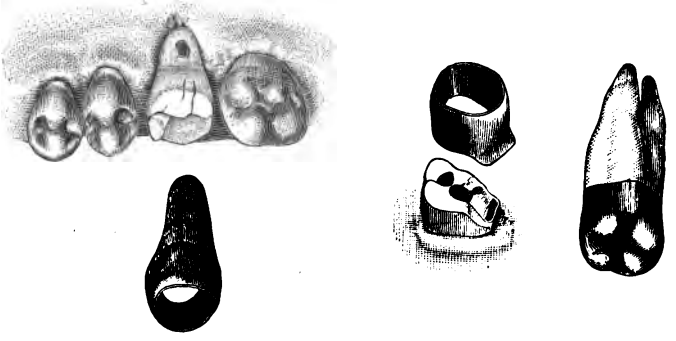
We are often called upon to save a grinder when it is not only badly decayed, but one root is partially exposed, and a decayed spot on that. We cannot fill it and make a nice piece of work of it, neither can we take a gold crown and slip it on in such a way as to get a perfect fit about and under the exposed portion of said root; yet we must save it, for it is a tooth our patient cannot afford to lose.

Meeting a difficulty of this kind, I solved it in the following manner. The tooth in question was a second superior molar, with the palatal root exposed for more than half its length.

The tooth was shaped and prepared in the usual manner for setting any other collar crown. Then a piece of platinum, 28 or 30 standard gauge, was used to make a band, and on this depends the success of the operation. This band should be made to fit perfectly the gingival border, and be soldered with pure gold, and when soldering enough gold allowed to run around the inside of the band to make a very thin lining. This can be done by subjecting the whole piece to a very intense heat. The gold serves the purpose of making a better union with the amalgam to be used later. The band is put back on the tooth to make sure that it touches all around the gum-margin. At the gum-margin the platinum should be dressed very thin and polished. Then mix the amalgam, putting all the mercury in the mortar that is intended to be used, and mixing the amalgam very thin—about like a thick paste. Then

with a spatula spread it around the inside of the band at the edge nearest the gum.

The amalgam left in the mortar is thickened by the addition of alloy to quite a dry condition. The tooth is dried, the band placed in position, and the edge burnished well up around the roots. Here we can bring the platinum well up under the irregular



parts of the root, and the thin amalgam will make a perfect joint. After this is done, fill up the band with the drier amalgam, which will take up the excess of mercury from the thinner, and uniting with the gold on the inside of the band, we have a solid mass that only needs trimming and polishing to make it the most enduring crown that I know of. It will save some of the old landmarks that we have looked at most of our professional life.

## PREPARING TEETH FOR BRIDGE-WORK.

Dental Review, May.

Dr. A. W. McCandless, in speaking on this subject, says the pulps of all teeth used for bridge abutments should be removed. There must be no exception whatever to this rule. His reasons are that a tooth with a live pulp will not permit sufficient cutting to make the work thorough, on account of severe pain to the patient. His experience has shown him the necessity for close fitting bands or crowns, which can only be made by cutting much more than a tooth with a living pulp will allow.

# ENGLISH TUBE TEETH IN BRIDGE WORK.

DR. JOHN GIRDWOOD, EDINBURGH, SCOTLAND.

International Dental Journal, October.

All the points of special worth given at the beginning of this paper on plate work (see article in Prosthetic department—ED. COMPENDIUM) are emphasized when tube teeth are used in bridge work. One of the great obstacles to making a denture of this kind a success is the difficulty met with in hiding the gold when the patient laughs. By the use of English tube teeth this is easily accomplished.

For fixed bridges replacing the front teeth they are less suitable, because of the difficulty found in securing proper self-cleansing space.

A case where the cuspids are past filling, and the molars still stand, will serve to explain the manner of constructing a large removable plate bridge with tube teeth. The crowns of the cuspids are to be cut level with the gum and the roots prepared after the usual fashion, the canals being drilled to receive a gold or platinum tube, which should be as long as possible, and sufficiently wide to accommodate a No. 13 post of hard gold. The molars are next trimmed to receive gold crowns, and a considerable notch is cut in the crown and anterior approximal surface of each. This notch (the object of which will be presently explained) should not extend on the coronal surface more than half-way back, nor on the anterior aspect more than half-way from the crown to the gum. Tubes are then placed in the roots of the cuspids and allowed to project about three-eighths of an inch. An impression of the mouth is next taken in plaster, in which the tubes will come away, and it is cast and opened as usual. The plaster teeth and roots are now trimmed, so that the cuspid caps and molar crowns when made will pass a little way beneath the gum-margin. The pattern of cap and band for the cuspid is the "Richmond," and care should be taken that each is made level with the gum on the labial side. Hard gold or platinum tubes are next soldered to them in lieu of the ordinary posts of single "Richmond" crowns. The fixing of these with cement in their proper positions and the operation of sealing the apical ends with gold or amalgam complete the preparation of the roots. They are then ready to receive their posts.

A Melotte die of each molar is next taken, and a gold collar made to fit it. This collar is notched on its anterior surface to suit the corresponding depression on the same surface of the natural tooth; the band is put on the Melotte cast, and a piece of No. 30 pure gold is placed over the crown and burnished to fit its upper surface and the floor of the notch referred to. When this is soldered to the collar, it gives an all-gold crown without cusps. A pure gold cap is next struck up and filled in with coin gold; it is ground level on its under surface, and is in turn notched at the same part as the gold crown already made. Having adjusted it to the latter, solder together, and you have an ordinary all-gold crown, plus the recess on the crown and anterior surface.

These crowns are cemented upon their respective teeth. Posts with bent ends are now placed in the cuspid tubes and allowed to project from them about three-eighths of an inch or more. A plaster impression of the whole is now to be taken; the pins will come away in it if the direction of the cuspid tubes has been carefully considered. (Before casting the impression, slip a small piece of metal tubing of such a size as will exactly fit the posts over each; this will prevent any alteration in their direction when they have to be withdrawn and replaced in their sockets during the making of the bridge.)

Having cast, opened, and hardened the model, proceed to make the clasps for the fixed molar crowns, as follows: First take a Melotte die of each tooth and cut a pattern, being careful to leave a portion of it high enough above the level of the tooth to permit of its being bent down and accurately fitted into the notch. The clasp is next fitted to the tooth, and the high portion is thinned down with a file and punched till it fits into the depression, as just indicated. It is now strengthened and contoured to the normal shape of the crown by the addition of pieces of hard gold soldered together with twenty-one carat solder. This forms a strong partial cap or spur, which, bearing on the gold crown, prevents the bridge's settling too hard upon the gum. It is better to make the band and spur from one piece of metal than to solder the spur to the band when fitted, for by the former way the continuity of the metal is unbroken. The clasp must be prolonged posteriorly to grasp the distal surface of the crown, in order that any tendency on

the part of the tooth to backward movement, by pressure on the spur (which will thus act as an inclined plane), may be prevented.

Now proceed with the swaging of the plate, which is made of two thicknesses of metal. Make the first one No. 24 gauge and about five-eighths of an inch wide all around. It must be struck up sharply and made to cover the cuspid caps. Next take a piece of plate, No. 26 gauge, and a trifle narrower than the first, and strike it over the latter; when fitted, solder the two together with twenty-one carat solder, and trim to shape the thick single plate thus produced. After having seen that the plate fits, drill it through opposite each cuspid tube to receive the posts, which are introduced into the tubes and allowed to project through the drill-holes on the lingual surface. Now adjust the clasps and place a little plaster around them and the cuspid posts. When it has hardened, remove the various parts from the model, stick them in their respective places, invest, and solder with twenty-carat solder.

When bands and pins have been soldered, try the bridge in the mouth and take the bite. Select suitable tube teeth, and fit them as in ordinary plate-work.

If the cuspid tube-tooth posts be thicker than the size of pin-wire, they are to be reduced by the file to suit the porcelain teeth.

Modification of this method can be used in the construction of any removable tube-tooth bridge. The point to be most noted is the treatment of the molars, a plan which can be adapted to suit any of the posterior teeth. It most surely prevents the "settling" of the denture and the tendency to movement on the part of the natural tooth.

### FIXED BRIDGE-WORK.

Fixed bridge-work offers but a limited scope to English tube teeth, for they can, as a rule, be used as substitutes for the masticating teeth only, for reasons which render useless the adaptation of Logan, Bonwill, and other all-porcelain crowns to like purposes. The idea must not be formed, however, that tube teeth can never be used here. In point of fact, they can, but on account of the shape of a front tooth which necessitates a short and weak lingual surface, often to be further destroyed to accommodate the bite, it has always seemed to me inadvisable to use them except in a few exceptional cases, where the bite of the lower teeth strikes abnor-

mally far in. Here they may safely be applied. The kind of case in which a fixed bridge with English tube teeth answers admirably is one where a gap in the dental arch extends from the wisdom-tooth to the first bicuspid. The first bicuspid is banded and capped, and a pin (which acts as post both to the root and tube crown) is soldered through it. A gold crown is fitted to the wisdom-tooth, and a strong oval-shaped twenty-two-carat gold bar is made which will connect the crown and cap, and ultimately carry the teeth. This bar ought not to rest on the alveolar ridge, but must be about one-sixteenth of an inch from it, and its angle with the alveolar border ought to be such a slope downward from the lingual to the labial side as will secure a perfect self-cleansing space. The anterior end of the bar must now be soldered not only to the bicuspid cap, but also to the base of the post itself, so that the strain may be borne by both. So far, then, the bar and cuspid cap are in one piece, the molar crown remaining unattached. Place these in their relative positions in the mouth; do any adjusting that may be necessary between the molar crown and the posterior end of the bar; take them off with plaster, as just described in this operation in plate bridge, and solder. A bite must now be taken, and the teeth set up on the bar in the usual way, being fitted to it and allowed to overhang its buccal edge. When the teeth have been cemented to place with sulphur, the bridge had best be inserted temporarily in the mouth till it has proved satisfactory, when it may be fixed. A fixed bridge like this may be inserted on either side of either jaw, and modified to suit such exigencies as intermediate roots, etc.

It must not be concluded that the possibilities of tube-work have by any means been exhausted in this essay. They are at once seen to be limited by the fault in construction of the front teeth mentioned previously.

A point of great moment to the tube-worker is the alloys of gold for posts. In plate-work these are made by English dentists about eighteen carats fine. This comparatively poor grade of metal is good enough for plate-work, but in crown and bridge-work something finer is required. For these the qualities most to be aimed at in alloying are toughness and non-liability to tarnish. Color as indicating purity is of no importance. From experience the author recommends the use of English coin gold alloyed with from one

and a half to two pennyweights of platinum to the ounce for all pins, posts, plates and bars. This alloy is so infusible as to admit of soldering with coin gold twenty-two carats fine.

The use of sulphur as an agent for fixing teeth on plates and bridges is strongly advocated. Excepting where it cannot (from its very nature) be employed, sulphur is far and away the best material. It will stand in mouths which are death to the very best cements, because none of the oral foods destroy it. Again, when repairs have to be done, where cement has been the fixing medium, the teeth can only be removed with great force by pliers, obviously a very unsafe proceeding. Indeed, if the pin and tube have been well roughened, the teeth cannot be, in many cases, got off without fracturing them. By the use of the agent advised all this trouble is prevented, for when the plate comes to be prepared you have only to heat it carefully and gradually till the sulphur melts, when the teeth may be easily lifted from their pins and refixed when the repair is effected.

It may be objected by some hypercritical individual that the appearance of the pins on the coronal surface of tube teeth seriously affects their value prosthetically. This, if objected to, may be overcome very easily. Having cut as much off the pin as you think fit, without impairing its function as a support to the tooth, take a white glass or porcelain rod of proper size, and insert a piece of it in the tube over the pin. This ought to be done before the teeth are finally fixed, so that the section of glass or porcelain will be firmly held by the sulphur. When finished, the most critical observer will hardly detect any break in the color of the crowns if the inlays have been well matched.

## TO PREVENT PORCELAIN FROM CHECKING.

DR. J. L. HASKINSON.

Ohio Dental Journal, April.

First, back the facing with very thin platinum, gauge 36 (Standard); and second backing, gauge 30 (Standard). Before placing this over the pins in the facing put on a thin piece of gold foil, three thicknesses of No. 4, then the thinnest platinum, No 36, coat very thinly with borax, then place on No. 30, press tightly down to

the facing and bend the pins over to hold in position; then trim all off, not allowing any of the backing to lay over the facing, but keeping them independent of each other, and before final backing see that they do not touch, leaving a very small space between each backing. Now invest, remove all wax, around the teeth and the space left between the first backing pack closely with gold foil; be sure not to let any borax come in contact with the facing, and this is overcome by packing in all the space between the caps. The foil being packed in this manner the solder will flow all over alike, as it makes a connection and leaves no places for the solder to jump, but makes it nice and solid with the gold foil. Also place a small roll of foil between the porcelain facing and the cusps, and force it down tight, and there will be no space left on the top of the facing after the bridge is flowed, and also allows for the expansion of the metals, as the soft foil is between the porcelain facing and the solid cusp.

## TREATMENT OF A FRACTURED INCISOR BY ELONGATION

DR. NORMAN S. ESSIG, PHILADELPHIA, PA.

Dental Cosmos, August.

One of the most disfiguring accidents that can happen to the mouth is the fracture of a central or lateral incisor (Fig 1); but such a disfigurement may be greatly lessened, if not wholly corrected, by the application of suitable appliances for the purpose of

FIG. 1.

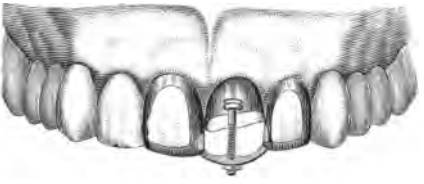
FIG. 2.

drawing down or lengthening the broken tooth. If the fracture is not more than one-third of the tooth, the broken tooth can be drawn down until the broken edge is on a line with the cutting edge of its neighbor. A very effective fixture, as shown in Fig. 2, can be used in such a case. It consists of two caps, enveloping the teeth on

either side of the broken one, made of No. 30 gold, twenty-two carats fine, the edges of which are allowed to pass quite up to the free margin of the gum. The caps are connected by a stout platinized gold wire, a little curved, so as not to interfere with the downward course of the broken tooth. A hole is drilled in the center of the bar or wire to admit a screw, so as to act upon the fractured tooth, which has a half cap or band fitting closely around its neck,

FIG. 3.

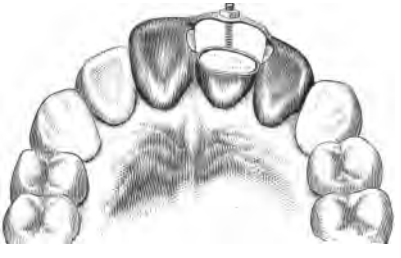
FIG. 4.



with a loop or ring soldered on the labial surface, as shown in Fig. 3, to which the other end of the screw is attached, connecting it with the horizontal bar which unites the caps shown in Fig. 4.

I have recently treated a case of this character where the left central tooth was broken off at a point fully one-third of the distance from the cutting-edge to the neck—the result of a kick received at foot-ball. The young man, who was about seventeen years of age, had very large well-developed teeth, which is always an advantage in a case of this kind, for if the teeth are larger at the margin of the gum than at the cutting-edge, there may be

FIG. 5.



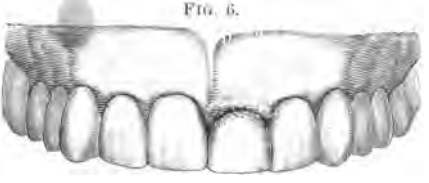
some difficulty in keeping the caps, upon which a downward pressure is brought to bear, from slipping off.

In this case a very good plaster impression was secured, and a thin separating saw passed between the teeth so as to allow the gold to pass well up between them while the piece was being made, and also to insure the passing of the edges of the caps well up to the necks of the teeth. The piece was made in the manner just de-

scribed, and to avoid too much of a display of gold the labial surfaces of the full caps were cut out, showing but a line of gold around the entire tooth. The patient came every day, and the nut was tightened until the pulling sensation was quite perceptible. In the course of three weeks the broken central was down on a line with the adjoining one. By grinding away the corners of the caps, covering the adjoining central tooth so as to bring its point into view (see Fig. 5), the operator may easily ascertain when the fractured tooth has been drawn sufficiently into line with its neighbor. The fixture was allowed to remain on for some time as a retaining-piece.

One of the interesting features of this operation is, that as the tooth is drawn down, the tissue follows, and when completed, there

FIG. 6.



is very little more of the enamel of the tooth exposed than before. Care should be taken that the nut be not turned too rapidly, for, though the delicate nerve at the apical foramen will bear a good deal of tension if administered slowly, its vitality might be endangered by a too rapid application of force. When sufficient time has elapsed, the piece may be taken off, and the broken edge dressed with a fine corundum-wheel and polished with a wood point armed with oxide of tin. Sometimes, if the teeth are long and the break extensive, the adjoining central tooth may be dressed down at the cutting-edge and also polished. In this case, and also two others recently made, the teeth were so nearly restored to their normal condition that the accident is not noticeable in the slightest degree. (See Fig. 6).

## ROOT TRIMMER.

Dr. Taggart, Chicago, has devised an instrument for this purpose, by soldering a collar on an ordinary fissure bur, just far enough from the end to give the required width of band.

# ORTHODONTIA.

## CORRECTING IRREGULARITIES IN YOUTH.

DR. A. E. MATTESON, CHICAGO.

Dental Review, January.

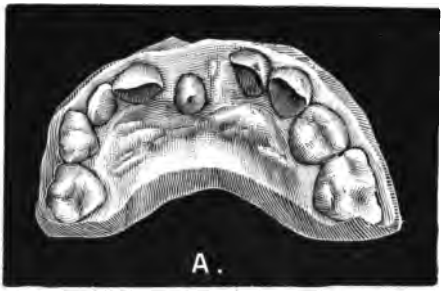
In all, a normal condition of health governs. Let us be governed by the same condition, but erase the age rule or law, and let this practice prevail. As soon as a tooth or teeth, erupting, shows such misplacement, that natural conditions or causes will not make it or them self-correcting, mechanical means should be at once resorted to, no matter what the age. Cases will rarely occur, where teeth, deciduous or permanent, are not present sufficient for anchorage or fulcrums for all the appliances necessary, if the case is presented at the time indicated above.

There has been so little written on this that it cannot be taken for granted that you are in advance of the teachings, and your attention is called to the forms of the deciduous molars, the crowns projecting but slightly through the gums, permitting an accurate impression being obtained, the roots diverging and thus affording resistance equalled by no other teeth in the mouth. We have at this time teeth erupting above and below; the four incisors presented in any abnormal position possible. Their course may be deflected by delicate appliances attached to caps covering the crowns of these molars, and cemented thereto, being so thin as not to disarrange the articulation. The effect would not be discernible upon the molars or but slightly inconvenience the patient while the erupting tooth or teeth are moving into line.

This procedure may be undertaken at any later time, under the rule before given, the only requisite being fixed anchorage; preference being given to light (weak) springs for teeth not fully developed, and later the same, with or without the screw principles (the positive intermittent method).

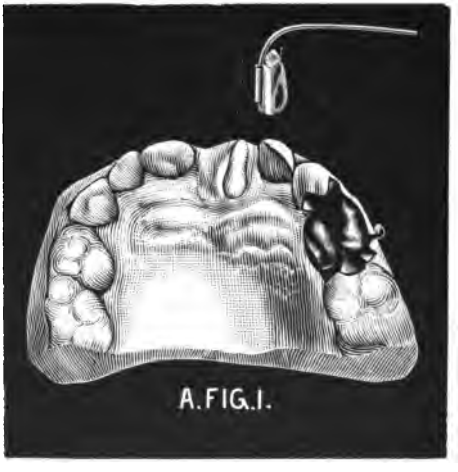
Plates made of rubber and covering the roof of the mouth for correcting irregularities are an abomination, a delusion and a snare.

I can conceive of no irregularity that cannot be more comfortably corrected, both for patient and operator, by other means. That satisfactory result mentioned by the authors, from the use of the "incline plane," in no single instance has been demonstrated in the practice of the writer.



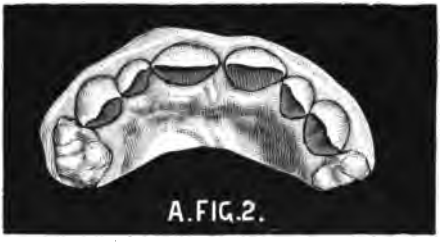

To illustrate more fully the practicability of early correction I shall present for your inspection the casts of several cases from actual practice.

Case A, age five and a half years. This case has been under my care upon the first presentation of the supernumerary tooth, too early to feel satisfied that it was a supernumerary. This was extracted, an impression taken and the tooth placed in impression and cast A made.

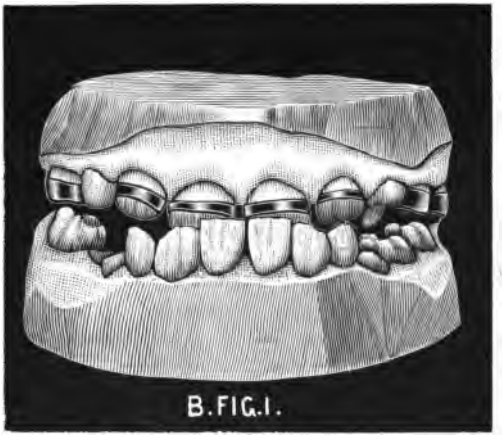



Several months later cast A Fig. 1 was made and a duplicate of Melotte metal, on which caps of gold and platinum plate covering

the tips (and extending slightly under the gum) of the erupting central incisor, to which was soldered a tube. A cap of the same metal was swaged over the right deciduous molars with a hook on the anterior buccal surface. A small spring wire was formed, one end passing into the tube on the central, extending in front of the left lateral and cuspid, and sprung into the hook. The tension


A.FIG.2.

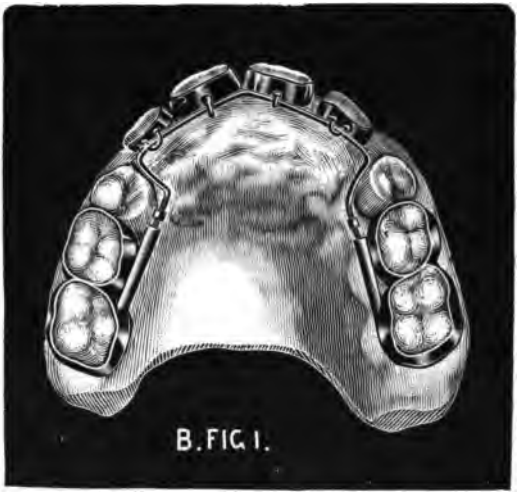
was very slight. The caps and spring are attached to cast A 1. The wire was bent from time to time until the tooth was brought into line. Six months later the right permanent central presented in the same relative position, and was managed in the same way, resulting in position shown in cast A 2.


B.FIG.1.

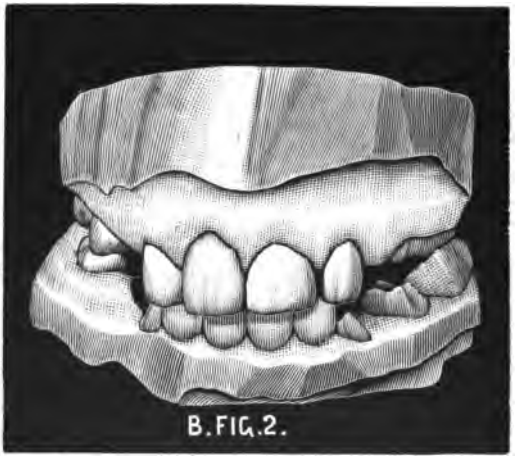
Case B, age nine. The appliances as affixed thereon (see casts B 1). Rubber ligature wrapped around the wire, posterior to the centrals, and hooked on to the lugs attached to the bands of the laterals, produces results as shown by cast B 2.

The case of prognathism would have proved a most difficult case to correct if postponed until later years, but was corrected

with but little more effort than that attending the correction of a single tooth. And the apices, undoubtedly, carried forward to a greater extent than it would have been possible had the correction been thus delayed.




A word of caution in correcting a number of teeth of this character: Make haste slowly. It should be borne in mind that teeth erupting require but a slight obstacle to deflect their course;




that an excessive pressure would, without much pain, result in the loosening of the teeth to such an extent that they might by a slight accident be easily dislodged when unsupported by adjacent teeth.

# TWISTED WIRE FOR REGULATING TEETH.

DR. WILLIAM S. DAVENPORT, PARIS, FRANCE.

International Dental Journal.

Fig. 1 represents the mouth of a young lady, seventeen to eighteen years of age.

The superior teeth articulate with those of the lower jaw—one cusp is too far forward, and the inferior front teeth are flattened backward, while their cutting-edges arch upward until the incisors nearly touch the palate.

The bicuspid region in the lower arch is broad enough to conform to, and permit the teeth to articulate with those of the upper jaw.

The vault is very high.

The upper lip covers about one-fourth the upper teeth, and the lower lip falls far back and under the superior incisors.

In the history of the case we find—

1. The patient, until four years old, had the habit of sucking her thumb, with its palm side placed against the roof of the mouth.

2. She was a constant sufferer from adenoid growths and bronchitis, on account of which the tonsils had been incised at the twelfth year.

3. She was a mouth-breather.

4. No similar deformity could be found among any of her relatives.

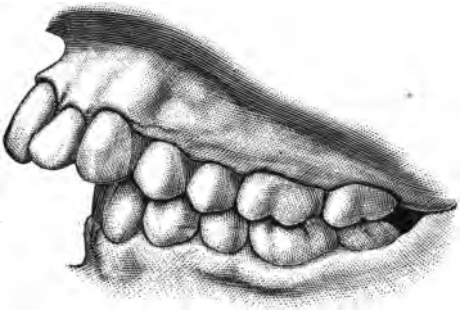
The first means employed towards correcting the irregularity was to push forward the lower incisors by the use of linen tapes, acting as wedges between these teeth and a corresponding edge of a plate which was fitted over the molars and bicuspids.

When this was accomplished a simple rubber retaining-plate was inserted, and the patient left Paris for the winter.

It was my intention, upon the patient's return, to spread the upper arch and attempt to jump the bite, but it was finally deemed more practicable in the present case to draw the upper teeth backward, and, to obtain the necessary space, the two superior first bicuspids were extracted. An appliance (Fig. 2) was then made, consisting of a rubber plate, which covered the upper back teeth. Into the right side of the plate was vulcanized one end of a half-

round platinum wire, which was passed around in front of the incisors and terminated in a loop at the free end. Two little hooks were soldered to the front of the band in such a way as to catch over the ends of the centrals when the plate was in the mouth, and prevent the wire slipping up against the gums. Into the left side of the plate a staple was vulcanized.

FIG. 1.



When the plate was in position a copper wire was passed through both the loop and staple, and had its ends brought together and twisted, thus producing pressure upon the centrals, laterals, and cuspids.

FIG. 2.

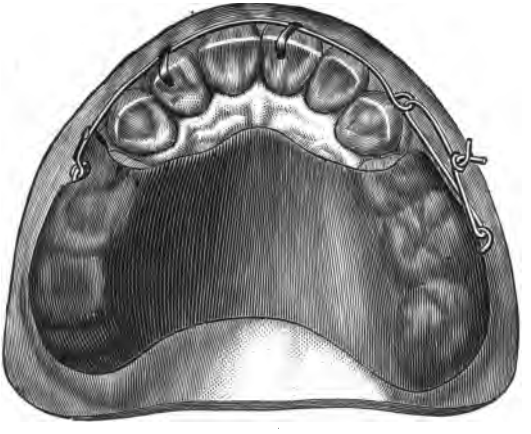


FIG. 3.

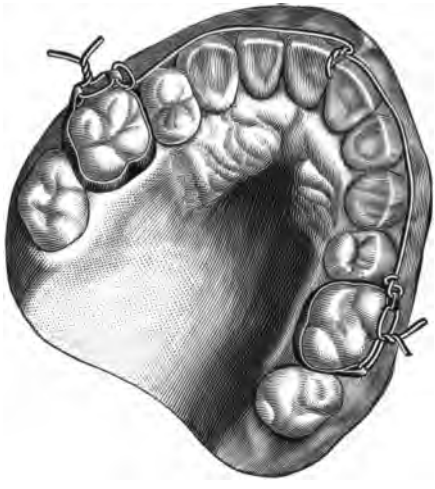
From time to time another twist was given to the copper wire, until, at the end of seven weeks, the teeth were in the desired position.

A retaining fixture was then placed, consisting of a strip of

pure gold, No. 5 to 6 Stubbs, and French gauge, so bent and soldered as to form a loop at each end.

Having previously separated the teeth with linen tapes, the looped strips were covered inside with thick chlora-percha and

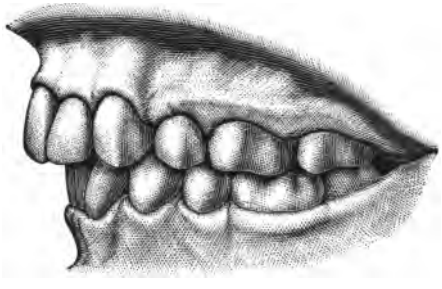
FIG. 4.



passed around the anchor-teeth, allowing the loops to be on the outer sides.

Copper wire was passed through these loops, and the ends of the wires were brought together and twisted (Fig. 3) until the pure gold bands were perfectly wedged to the convexity of the crowns,

FIG. 5.



forcing the superfluous chlora-percha out at all points and making an accurate fit. (These bands did not move until taken off four months later.)

Copper wires were fastened to the loops left in the band at the buccal surfaces of the teeth, and brought around the front teeth

from both sides and twisted together at the centrals. This drew the six front teeth to their exact places. The twisted ends were then bent over the cutting-edges of the centrals, to protect the gums from the wire. All rough places at the sides were then covered with gutta-percha.

Fig. 4 shows retainer in position.

By comparing Fig. 5 with Fig. 1, we find the six front teeth were drawn directly backward.

The patient was instructed to remove the plate while eating, and by so doing a very good articulation at the finish was secured.

Positive and intermittent force is secured by such a use of twisted wires as above indicated. The principle involved is that of the inclined plane, which is also the principle made use of in the screw.

Appliances dependent upon twisted wire for the application of force are easily made and applied, and possess many obvious advantages over the screw in very many cases. Wire of silver, galvanized iron or copper, owing to their pliability, strength and cheapness, will be found very satisfactory.

## REGULATING APPLIANCES.

International Dental Journal, November.

Dr. Smith presents some simple appliances well worthy of note. An including lateral was brought out in seven days, as follows: A band was made to fit the tooth, a screw post was soldered to the labial side of it, a bar was made to reach across, resting on the cuspid and central; a hole in this bar allowed the post to pass through. The band was cemented on the lateral, the bar place with the post passing through it. A nut was placed on the post, the tightening of which pulled the lateral into position. No caps or plates to keep the jaws apart to allow the malposed tooth to pass over the lower were used; none are needed, as the teeth at rest, are apart.

In another case, the lateral was very much crowded. Instead of making a ferrule, a gold plate was made to fit the labial surface of the tooth, and secured to it by a ligature wound around the tooth, commencing at its neck and carried to the cutting-edge. The post

was soldered to the gold plate. That case was also completed in seven days without any trouble; and when the tooth was in place, there was no need of a retaining fixture.

In another, the lateral was twisted and was turned a little as it was brought to place. The appliance used contained two posts and two screws. In other respects it was the same as the one first described.

## RETAINING FIXTURES.

An outstanding tooth has been moved to line and a retaining fixture is necessary. Such is retained simply by a band with two prongs attached to it, one on the inside and the other on the outside. Another retaining fixture which was worn for seven months was made by striking up caps to fit over several teeth and cementing them in place. The gold was somewhat unsightly, and it was afterwards made less cumbersome with the use of a little wire crib.

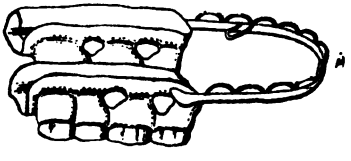
In case you have spread an arch and want to hold it in place, it can be done by putting in a vulcanite plate covering the arch.

## METALLIC REGULATING PLATE.

DR. GEORGES GAILLARD.

From the Book Des Deviations Des Arcades Dentaires et de Leur Traitement Rationnel.

This plate is made as follows: Two metallic caps usually of hard platinum are struck up, for each side of the mouth, to cover the second bicuspids and first molar on each side of the mouth, the deciduous molars in a younger subject.



These two capsules are united by a half-round wire A, of platinum or gold of about two millimeters in breadth; moreover, the upper part of the apparatus must correspond exactly to the free border of the gum, and this half-round wire has soldered to it a

series of little rings in gold or platinum of about three-tenths of a millimeter in diameter, undulated and soldered at the point of contact. The caps present also a gum margin which prolongs itself about five millimeters above the neck of the tooth, inside as well as outside the arch. These caps are filled up on the masticating surface or cut out according to the necessity of enlarging the two arches or not.

On the palatine and labial side of these crowns are seen openings which correspond to the intervals between the teeth and whose object it is to allow silver ligatures three-tenths of a millimeter in diameter to pass, so as to fix the plate in position, which plate is so kept immovable until the next visit of the patient.

The active part of the regulating is done with square rubber pieces of one, two or three millimeters, which are passed around the tooth to be straightened and tied with silk to the external band. The advantage of this plate is when fixed in position, the child cannot possibly remove it and has to keep the apparatus on until he returns to his dentist, and the consequence is that is brings on a termination of the regulation in a very short time.

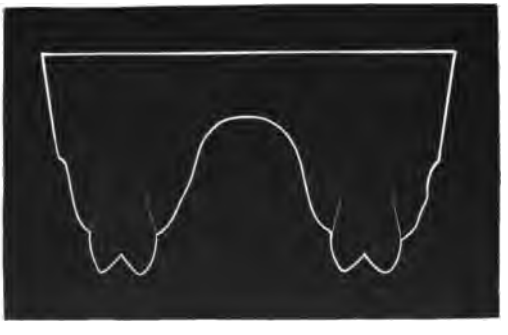
## DIFFICULT CASE IN REGULATING.

DR. C. S. CASE, CHICAGO.

Dental Review, March.

On November 23d I inserted a Coffin split plate in the mouth of Miss R. S., age fourteen. You will see by the model of the

FIG. 1.

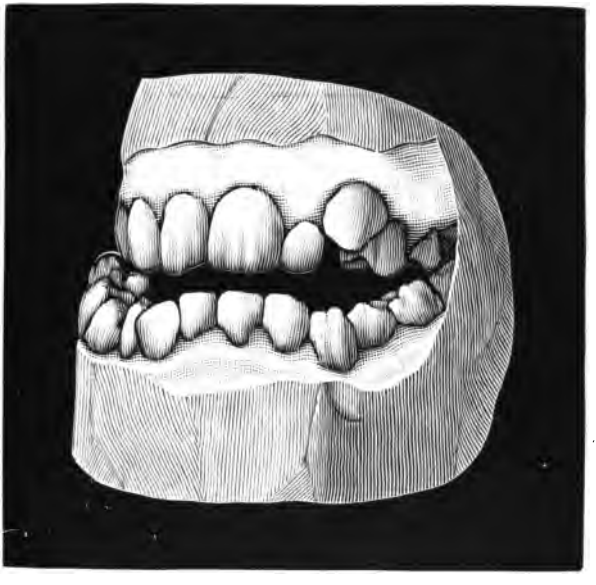


mouth, at that time, that the dome of the arch is rather high and contracted. (See Fig. 1.)

By December 23d the alveolus expanded in the vicinity of the second bicuspids more than one-eighth of an inch. The entire dome of the arch was considerably broadened.

The plate differs from the ordinary Coffin split plate in that it carries two springs instead of one. The second one passes from the buccal extensions around in front of the teeth, also the ends of the springs are not fastened by vulcanizing them into the rubber; my method being to draw tubes of German silver or zinc to exactly fit the wire I determine to use. (Usually gold plated piano wire Nos. 10 and 12.) These tubes are vulcanized into the plate in

FIG. 2.



such positions as to properly receive and give a rigid bearing to the endings of the wire springs; by which method I am enabled o change the springs at any time they are found to be imperfect or their surfaces eroded. Instead of bending the wire in the usual form of a simple spring, I invariably add one or two coils, which facilitates separating the two halves when I wish to increase the pressure. The labio-buccal spring is used when I desire a posterior expansion of the arch, with little or no change anteriorly.

As it may be of interest to follow the progress of this case from the beginning, relative to other changes, I will give a brief description with the methods employed.

The models here presented (see Figs. 2 and 3) are an exact representation of the relative positions of the teeth, at the beginning of the operation, during a masticating closure of the jaws—or one in which the lower jaw is carried as far back as possible.

It will be seen by this that the peculiar shape and closure of the lower jaw permitted only the posterior molar teeth to occlude.

FIG. 3.

Between the occluding surfaces of all the other teeth there was a space of from one-sixteenth to one-quarter of an inch. The alignment of the lower anterior teeth were far in front of the upper, so that the space was increased by the usual incisive movement of the jaw. In the act of biting off morsels of bread the thumb had always been used in place of the lower teeth.

With the jaws in this position I took a plaster impression of the face which I here present. (See Fig. 4.) This will be acknowledged by all who knew the patient before the operation as a model of the face in as perfect a pose as it was possible for her to assume.

I first removed the first inferior bicuspids and banded all the

Fig. 4.

Fig. 6.

lower teeth. On the buccal surfaces of the molar bands I soldered long anchorage tubes, from which I extended a flattened bar or wire—(threaded at the ends for nuts)—around in front of the lower teeth, passing it beneath small hooks soldered to the outer surfaces of each one of the bands. This bar was supplied with small buttons soldered to its lower border, which were used ultimately for the attachments of rubber bands extending to the upper, for the purpose of slowly lifting from their sockets all the unoccluded teeth—as I shall more fully explain later. Some of the teeth which required special extension carried extra hooks or buttons, while others were supplied with rotating tubes.

At the same time (November 23d) that this apparatus was attached to the lower, the expanding plate—which has been described in the paper—was fitted to the upper and the patient sent home with directions to her dentist to turn the nuts at the ends of the bar, and with explicit injunctions to remove and cleanse the plate and mouth after every meal.

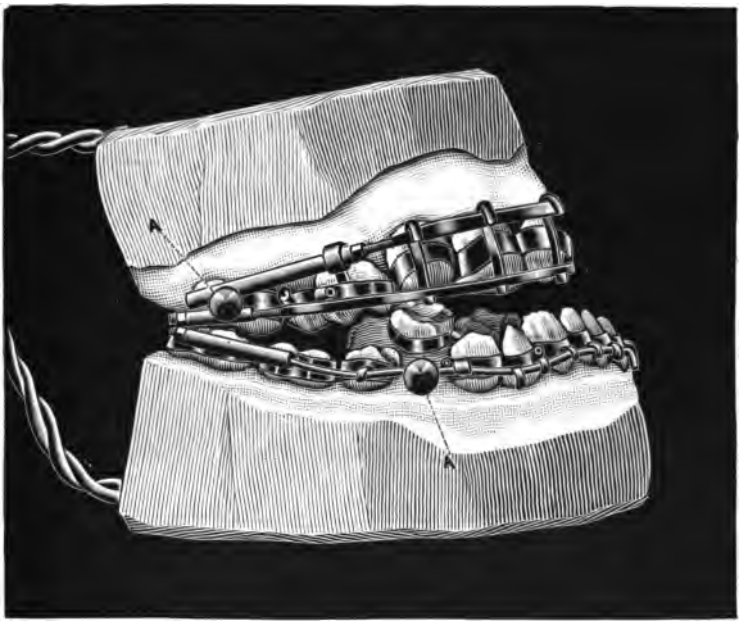
On December 24th, I removed the expanding plate and attached appliances to the upper for the further regulation of the teeth. All the upper teeth were banded and to the buccal surfaces of the posterior bands long anchorage tubes were soldered. From these tubes a flattened No. 18 gauge bar extended around in front of the teeth, made of very rigid German silver wire. This was threaded at the ends and used for the purpose of forcing the anterior teeth forward.

It will be noticed by examining the model of the upper that the incisor teeth already pitched forward considerably, leaving an unusual depression at the incisive fossæ which produced a lack of perfect contour of the face beneath the nose. My object therefore was to so apply the force that the cutting edges of the incisor teeth were held in position, while their roots and the labial alveolus was forced forward; principally for the purpose of bringing out a fuller and more perfect contour of the face.

This I accomplished in the following manner: The incisors were banded with wide, well-fitted bands; to the anterior surfaces of which were soldered flattened bars that extended from the cutting edges of the crowns to a point somewhat above the margin of the gums where they ended in a hook that received the bar from the molar anchorage. Beneath the anchorage tubes, on each side was

soldered a second shorter tube, from which extended a thin narrow band that rested in fitted depressions cut in the lower ends of the upright incisor bars. To the ends of this band were attached threaded bars with nuts working at the posterior ends of the short tubes. By this simple contrivance it will be seen that the requisite force was properly distributed and the movement of the teeth perfectly controlled. A very important additional force, to this apparatus, was obtained by the use of rubber bands, as follows: To the buccal surfaces of the most posterior extensions of the upper appliances were soldered large headed buttons from which extended

FIG. 5.



rubber bands of considerable tension to similar buttons on the lower bar in the vicinity of the bicuspids. (See a a, Fig. 5.)

The horizontal position of these bands prevented them from materially interfering with the movement of the jaws and therefore were worn continuously, greatly relieving the load upon the anchorages by reciprocating the opposing forces used on the anterior teeth. They also tended to lift the lower teeth to a more perfect occlusion. In connection with this, small rubber bands extended

from the lower bar to superior teeth that were far out of occluding alignment.

These were removed by the patient during the process of mastication, but worn at all other times.

I here present the models with a similar apparatus attached to the teeth that was worn by the patient. The rubber bands are not attached but the buttons and hooks will show where they belong. (See Fig. 5.)

In examining the model of the face which was made at the beginning of the operation, notice the lack of proper fullness beneath the nose and the prominence of the lower lip, which gives the impression of a protrusion of the lower jaw. Now compare it with this model of the face from a later impression. (See

FIG. 7.

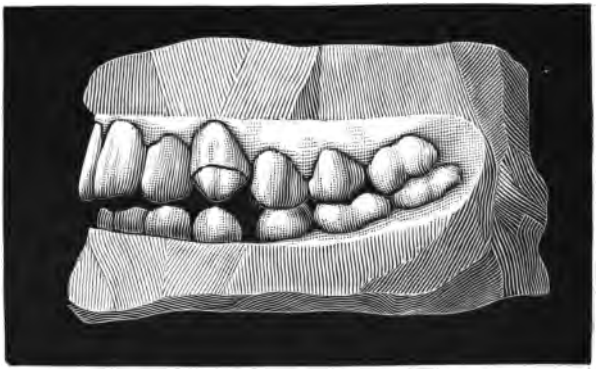


Fig. 6.) You will see a material change in this particulra, due almost entirely to the peculiar change that has been brought about in the position of the anterior teeth and the alveolus, which has pushed forward that portion of the face immediately beneath the nose and at the same time allowed the lower lip to fall back and assume a more natural and easy position.

The change in the position of the teeth that has at present been produced will be seen by this model (see Fig. 7), which was made from a modeling compound "bite" taken recently, the appliances having been temporarily removed.

# ALIGNING THE TEETH.

DR. L. JACK, PHILADELPHIA.

International Dental Journal, July.

The author says he has used this appliance for several years with great satisfaction.

In reference to the alignment of teeth, carrying them in when they are too far out and bringing them out when they are too far in, he uses this plate almost invariably. It is composed of two pieces of vulcanite joined by a band of gold. (See Fig. 1.)

The posterior teeth are made the base of resistance by covering the second bicuspid and the molars of both sides by two separate shoes of vulcanite, which extend at either side of the teeth but a few lines beyond the margin of the gum. To give these shoes strength and to enable the patients to masticate upon them, they are surfaced with gold swaged to the form of the ends of the teeth. These gold facings are vulcanized to the shoes in their proper places.

Some preliminary preparation of the cast is required to enable these shoes to hold firmly their position. They should go on with a little springiness. The cast is trimmed with a suitable instrument to take a shaving from the teeth at the neck, and also a shallow groove should in most instances be made in the plaster, at the gingival margin. The proper amount of cutting is quickly gained by experience.

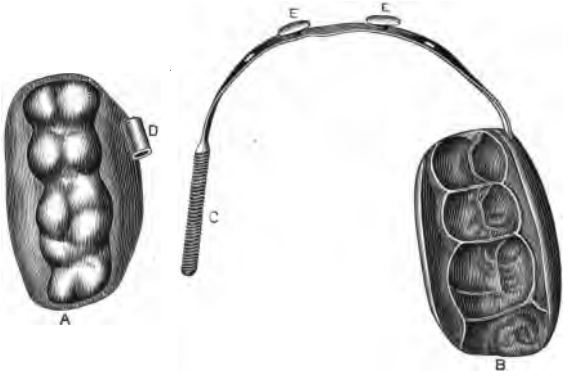
These bases of support for the movement of the teeth are connected by a narrow band of springy gold, one end of the bar being secured to one of the shoes, the other end being attached to the opposite shoe by a male screw fitting in a screw-cut tube or, with proper precautions, vulcanized into a projection on the outer plate of the shoe.

The reason for this plan is that by turning the free end of the appliance the bar may be reduced or increased in length. If in any given arch a tooth or more is projecting and others are depressed, the bar is brought into contact with the most prominent tooth, and a piece of elastic rubber is placed between this point of contact; at the same time a rubber ring is carried over each of the teeth which are within the arch and is drawn through a hole opposite the tooth

and extended to a button. On the next day the bar is screwed up enough to be again in contact, when a new pressure may be made or the tooth is rested, as the conditions require. If the depressed teeth are sore, they may be rested by tying through the same channel as the ring had passed. Remove these plates daily, each time making a gain in the progress. It is important to make this daily change for the sake of cleanliness, the patient brushing the teeth while the further preparations are being made.

As before intimated, all the front teeth may be moved at the same time either outward or inward.

FIG. 1.




*A* represents the masticating surface of the movable shoe, showing gold facing.
*D* represents the inner surface of the fixed shoe.
*C*, the screw which fits into the screw cylinder *D*.
*E* shows the buttons to which the india-rubber bands are attached.

Rotation may also be conducted by the various attachments made for that purpose by connecting the rubber band to the attachment, and many modifications of this simple description will occur to meet the exigencies connected with the alignment of the teeth.

It is almost needless to state that the impression of the teeth should be taken with plaster.

This method may be made useful in the treatment of cases at a distance whenever either of the parents of the child has the intelligence to comprehend the mode of operation of the plate and is capable of applying the required instruction. In this connection he has conducted the correction of a great protrusion of the upper teeth and concurrent depression of the lower arch for a patient living a thousand miles from me, the mother each day making the necessary changes of the plate or ligatures. The upper teeth were

forced backward in the manner described, and when their position was corrected, a similar plate was placed on the lower teeth, when they were gradually brought outward into correct relation with the upper arch. This necessitated but three periods of attention on my part.

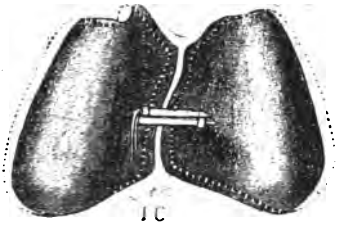
The only originality in connection with this appliance is the division of the old form of upper plate which was used to separate interlocked arches and to connect these by the screw at one end of the bar. He presents this method as comprising many advantages for the purpose for which it is intended, and in this purpose is included the greater number of irregularities we have to treat.

## APPARATUS TO ENLARGE THE ARCH.

MR. FRANCIS JEAN.

Odontologie, June, and Revue Internationale d'Odontologie, January.

It is an ingenious plate, constructed as follows: Two metallic square rods of one millimeter and a half thick are placed in a parallel direction, each penetrating in a sheath made of the same metal. At the extremity, enclosed in the rubber plate, a piece of metal wire is soldered to each sheath, so as to hold it firm in the plate.



This little apparatus, when finished, represents when, the plate has been divided in two in the medium line, a rod and a sheath fixed each side on the palatine surface.

The point at which this rod and sheath are to be placed is chosen according to the direction in which the displacement of the arch is to take place. If one wishes to act on the whole palatine arch, so as to obtain a complete expansion, the palatine surface, or

roof of the mouth, from the central incisions to the last molars, must be covered by the plate. The extremity of one rod and of one sheath must then be fixed in the center of each half of the plate in wax, and a line drawn in the direction which is to be followed by the saw, in dividing the plate when vulcanized. Now the important part is the mode of action of the plate, which is to separate gradually and mathematically the lateral parts of the apparatus, and to maintain them in that position.

To do this, the two halves of the plate must be separated one from the other, and a platinum wire of half a millimeter thick is placed around the part of the rod where it comes out of the rubber. This will prevent, when the two halves will be joined together again, the rod penetrating to its full extent into the sheath, so that

3A

4

the two halves of the plate will be separated by a space equal to the thickness of the wire. Every three or four days another turn of a wire is added, and the separation of the plate will be so much increased. This is continued until the desired effect is obtained.

If only a few teeth, say the bicuspid, are to be pushed out, the plate can be made much smaller, and only large enough to press upon these particular teeth. If to correct the deformity, in addition to the expansion of the arch, one desires to obtain a pressing backwards of the anterior teeth or incisors, a very narrow metallic band is passed in front of these last, the extremities of which band are fixed in the cheek side of the apparatus on a level with the bicuspids. In this case the crown of the back teeth is to be covered with rubber, so as to be able to fix the band on the outside.

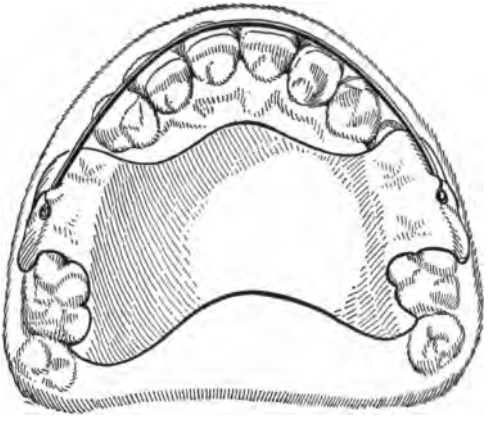
# ALIGNING THE TEETH.

DR. S. G. PERRY, NEW YORK.

International Dental Journal, July.

Cap the bicuspids, and sometimes the first molars, with a simple rubber plate, which is made with a little ridge rising over the bicuspids. Through this ridge a very small hole is drilled and countersunk on the distal side, and then the thinnest saw procurable is passed through the rubber into this hole. A knot is then tied at each end of a very thin piece of elastic—such as is used in place of wrapping-twine for boxes, parcels, paper, etc.—and the

FIG. 1.



ends slipped through the cuts into the holes. The knots drop into the countersunk ends of the holes, and so are safe from the danger of chafing the overlying lips. The pressure is varied, of course, by tying the knots closer together or farther apart, as the case may be. When the plate is in place, the elastic is drawn over the front teeth, and if care is taken in drilling the holes in the ridge on the plate at just the right place, the elastic will not ride up against the gum or slip off from the front teeth. This device is the closest fitting and the most comfortably worn of any I have ever used.

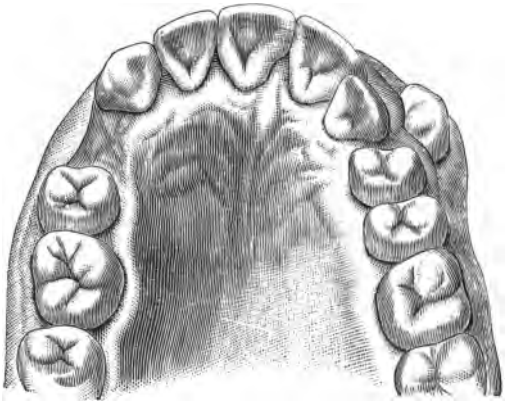
# A REGULATING CASE INVOLVING CORRECTION OF THE POSITION OF THE MEDIAN LINE OF THE ARCH.

DR. NORMAN S. ESSIG, PHILADELPHIA, PA.

Dental Cosmos, June.

This case, which was that of a boy of fourteen years of age, presents some interesting features. First, as will be seen in Fig. 1, the cuspid was completely out of the arch, the lateral incisor and bicuspid being in contact. Secondly, the central teeth were so much to the right of the median line as to constitute a deformity.

FIG. 1.

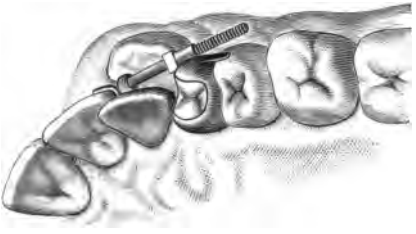


The two objects to be accomplished, therefore, were to correct the center line and bring the cuspid into its proper position in the dental arch. To accomplish this it was necessary to take out the first bicuspid on the opposite side of the mouth, thus leaving a space which, if the median line were moved to its normal position, would be filled by the cuspid, which was in the position usually occupied by the lateral incisor. After the bicuspid on the right side of the mouth was extracted, an impression was carefully taken, and the model or cast thoroughly dried and well soaked with sandarac varnish. An excavator was then passed around the teeth, cutting away the plaster representing the gum margin, so as to allow the caps to extend a little under the free margin of the gum when the piece was put in the mouth. After this was done, the caps were made for the bicuspid and the lateral incisor, as shown in

Fig. 2. These were made of twenty-two-carat gold, of about No. 30 thickness, and fitted snugly to the plaster, and in the case of the bicuspid the gold was carried up and just a little over the cusps, as shown in Fig. 3.

FIG. 2.

FIG. 3.



The cap for the lateral incisor was provided with a socket on the labial surface, into which the bar was fitted, allowing of some movement while the teeth were being pushed toward the median line. This cap was also provided with a small arm or lug, which bore against the adjoining tooth in such a manner as to prevent the capped tooth from being pushed out of line while the space between them was being enlarged, and insure the movement of all the teeth bodily toward the left. The nut, which was given one or two turns each day by means of a small wrench, was placed next to the cap on the bicuspid, which was provided with a cylindrical attachment through which the screw passed. The pressure caused by the tightening of the nut lengthened the screw, and thus widened the space for the reception of the cuspid.

FIG. 4.

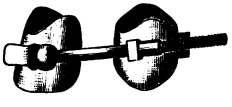
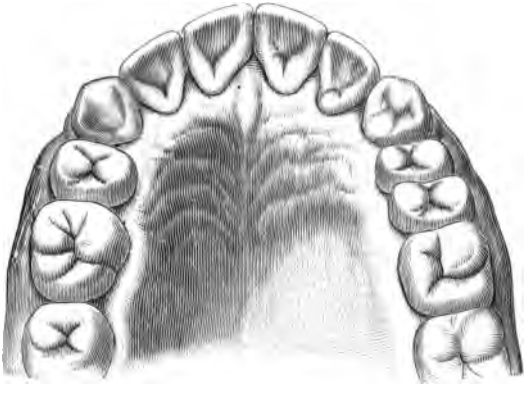


FIG. 5.

A suitable wrench may be made from a discarded excavator; of course it is understood that no thread is needed inside the cylindrical attachment on the bicuspid cap, as it is desired that the screw as it is passed through should be free to respond to the pressure of the nut, Fig. 4. The cuspid came down into place as the distance between the bicuspid and the lateral was widened, and when it was fully erupted a collar of gold was made which fitted up closely to

the neck of the tooth, and a small loop of gold was soldered to the labial surface, to which was attached a rubber ligature, which helped to draw the cuspid into place more quickly. The ligature was attached to a little gold button on a small rubber plate.

FIG. 6.



After the space was enlarged to receive the cuspid it moved very rapidly, and in its downward course came in contact with the bar or screw, which was then removed and a curved one substituted (Fig. 5), which allowed the cuspid to pass inside, thus allowing it to continue on downward into the space prepared for it. The most remarkable feature of this operation was the quickness with which all the teeth responded to the pressure as soon as the force was brought to bear on the lateral incisor. When the median line was brought to its normal position and the teeth in their proper place, the fixture was allowed to remain as a retaining piece for about three months.

This case was finished about two years ago, and since that time there has been absolutely no change in the position of the teeth, and their regularity is one of the noticeable features of the mouth. (See Fig. 6.)

# SOLDERING BAND ATTACHMENTS WITHOUT INVESTMENT.

DR. GARRETT NEWKIRK, CHICAGO, ILL.

Dental Cosmos, June.

Join all bands in the making with high-grade solder—twenty or twenty-two carat. To attach a hook or tube to a band, first hold the latter with a pair of moderately thick pliers at the point of union. That this may be kept below melting point and from danger of unjointing, place a little flux and eighteen carat (or lower) solder on the spot where attachment is to be made, and melt with a fine flame of the blow pipe. If a bit of tubing is to be placed, take a piece of wire six or eight inches long, or any slender instrument the point of which will fit within, having this covered with a thin coating of a thin mixture of whiting (or rouge) with water, to prevent a flow of solder inside the tube, or possible sticking to the wire or point which we are to use as a holder in making the attachment. Now, with a reasonably steady hand, holding the band as before with pliers, the tube, fluxed on the joint side, may be quickly and accurately fastened to the band over a small gas flame; a piece of wire may be attached in the same manner, leaving it long enough to serve for its own handle, and cutting off to proper length after soldering, or the hook may be held with jeweler's fine pliers.

Another method, and a good one, is to punch a hole in the band just large enough for the close insertion of the end of the wire, which should be fluxed, when it may be securely fastened with a bit of solder. This is an excellent way to attach screws of the "Angle" jackscrew sort.

Speaking of this reminds me that the so-called "pipes" of the "Angle set" are identical with those kept in stock by the wholesale jewelers under the name of "joint wire," in three or more sizes, and sold at about a cent an inch, German silver. The large size is available for jackscrew and traction purposes, with No. 18 gauge wire screws; the smaller for use in connection with spring wire for rotating teeth. This "joint wire" is also available for tubular posts in crown-work—being very strong, and made with absolute accuracy.

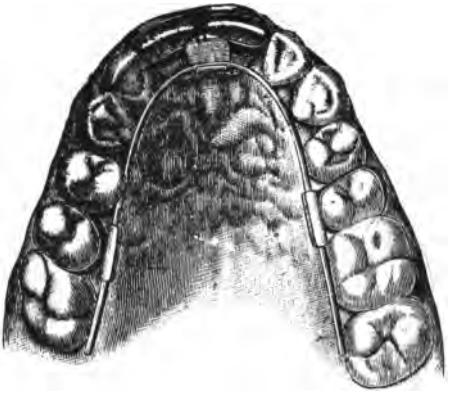
# LINDENBERGER'S APPLIANCE.

DR. H. LINDENBERGER, BOWLING GREEN, MO.

Dental Cosmos, June.

The appliance, as will be seen in the illustration, is constructed as follows:

A band is fitted to each of the central incisors and the two second bicuspids or first molars; the central bands are soldered together, at the same time attaching a small strip of plate, which, upon being bent upward, forms a support for the center of the curved wire. Upon the palatal surfaces of the posterior bands is soldered a section of split tubing, which forms a trough against which the extremities of the wire rest. When the appliance is thus far com-



pleted it is placed upon the model, and a piece of piano wire of sufficient length is bent to conform to the inner surface of the arch (assuming somewhat of a U shape). This wire, as will be noticed, is not attached to the other parts, hence admits of easy removal, either for cleansing, readjusting, or to substitute a larger or smaller wire, to produce greater or less pressure as the case demands.

A slight modification of this appliance may be made to include another class of irregularities, viz: protruding centrals.

In such cases the first bicuspids, or possibly the cuspids, should be banded, instead of second bicuspids or first molars; then, proceeding as before, both retraction of centrals and expansion of arch can be accomplished simultaneously.

Should a tooth be inside the arch, by shaping the wire to

strike this tooth it may be forced into proper position. A tooth outside the arch may also be brought back by attaching it by ligature to the wire.

Thus, while teeth may be brought into proper position in the arch, the process of expansion may proceed at the same time, if desired. This process is applicable with equal facility and effectiveness to either the upper or lower teeth.

The simplicity of this appliance is not its only recommendation, as a trial will prove it to be of value for the purposes designed.

## MOVING CUSPIDS.

DR. N. S. ESSIG, PHILADELPHIA.

Dental Cosmos, April.

The case selected to illustrate the efficiency of the screw in moving irregular teeth is a cuspid that was not onlyg reatly out of its normal place in the arch, but much turned upon its axis. Here it was necessary to draw it back so that it might be made to assume its place between the lateral and second bicuspid,

FIG. 1

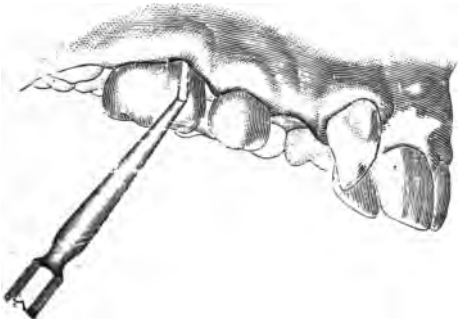
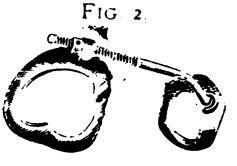


FIG. 2.



and at the same time to turn upon its axis. This was accomplished by hooking the bar into a staple soldered well around on that part of the cap covering the labial surface of the tooth.

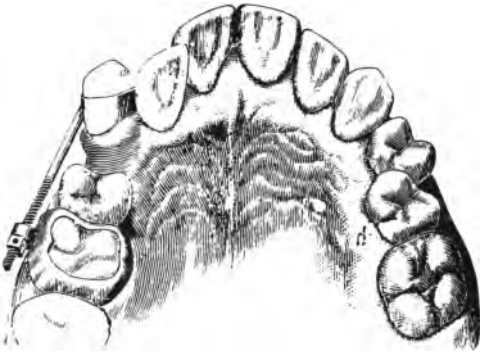
An excavator was passed around the molar at that position on the model representing the free margin of the gum, cutting away the plaster from around the neck of the tooth, exposing what would

correspond to that portion of the tooth or root just above the enamel, as in Fig. 1.

No. 30 gold, about twenty-two carat, is used and burnished down, forming a cap which fits the tooth perfectly, following the line where the excavator has cut away the plaster.

If such a band is to be placed upon an incisor or lateral, the face of the cap may be cut out, thus avoiding too much of a display of gold. Thin platinum may also be used, about the thickness of writing paper, and pure gold flowed over the surface after the piece is invested, but it is rather difficult to get the gold evenly distributed over the platinum.

FIG 3



The first molar, on account of its being provided with three roots, is usually the best tooth to select for the point of resistance, for being reinforced by the bicuspids, it makes it pretty certain that it will not move when the screw is in operation.

The gold is brought just over the edges of the cusps, and burnished to conform to the contour of the crown; the bar is then put in position, as shown in Fig. 2, and the loop or rings by which it is attached to the caps, cemented on with hard wax. It is then invested in sand or marble-dust and plaster, and the rings soldered on.

In making the caps it is better to have them a little loose, as the oxyphosphate with which the piece is cemented in will fill up between the gap and tooth, thus preventing moisture from creeping in under the gold.

Platinized gold should be used for the bar, as the thread is not so likely to strip, and it can be made of thinner wire.

When the piece is finished we have a fixture which will exert a force in a given direction sufficiently strong to move any tooth in the mouth; and while the force is not a persistent one it is positive and certain, and unaccompanied by any inflammation or soreness.

Some members of the profession, who saw this piece before it was put in the mouth, expressed the opinion that the molar to which the fixture was fastened as a point of resistance, and also the bicuspid, would move before the cuspid did. The result showed, however, that this was not the case. The cuspid was not only drawn back, but turned on its axis. The position of the tooth before correction is shown in Fig. 3, and it was brought back into perfect line with the incisors. The molar and bicuspid did not change place in the slightest degree.

## OTTOLENGUI'S METHOD OF ROTATING TEETH.

DR. R. OTTOLENGUI, NEW YORK.

Dental Cosmos, November.

If it be true that the danger of rapid movement is in proportion to the amount of movement, I have but to show that in the act of torsion a tooth is but slightly moved, in order to support my theory that teeth may be twisted rapidly with little if any danger. And when it is remembered, as it should ever be, that any regulation of the teeth which covers a long period of time becomes a distinct strain upon the nervous system of the child, one sees at a glance that where it can be done in safety, the most rapid movement of teeth is the best and only method which should be adopted.

It is my intention to show you a typical example of the several conditions wherein torsion is required, and to point out the amount and direction of the movement. But first I will call your attention to my methods.

It is well known that to rotate a tooth in its socket, it is necessary, in some way, to produce a pressure which will act upon one corner in one direction, or else upon both corners in opposite directions. Numerous devices for this purpose have been employed.

My method is to band the teeth with gold, having one or

more hooks upon the band, as may be required for the individual case. This band is made very easily. Use pure gold plate of twenty-eight gauge. Having cut a strip as narrow as possible for the purpose, bend it approximately to shape with the ends turned up at right angles. This loose open band is slipped over the tooth, and not carried much beyond the cutting-edge. The ends are then caught with the serrated beaks of a pair of pliers, and drawn tightly together, which produces a tight-fitting band, except that as the palatal surface of the central incisor is concave, the band will pass straight across that surface, leaving a space. Later, however, when the band is set with cement, and pressed farther up, so that it impinges upon the bulbous part of the tooth, it becomes more accurately adapted; the loose ends are united with a tiny bit of solder, and then turned down to form the hook. Where two hooks are needed, begin with two strips soldered together, and when the loose ends are united, bend both extensions to form the two hooks. The bands are cemented to the teeth, and so are permanently fixed until the rotation is completed. With a central incisor banded in this fashion, if a rubber ligature be thrown over the hook at the anterior labial corner, carried backward and attached to some fixture within the mouth, the anterior corner of the tooth will be carried in. If, however, the ligature attached to the same hook be carried around the palatal side of the tooth, and outward around the posterior corner, to be attached to a fixture outside of the arch, the result will be a rotation which will carry the anterior corner inward and the posterior corner outward at the same time. A similar result obtains when the ligature is hooked on the posterior palatal hook, then carried around the labial surface and inward around the anterior corner, to be attached to a hook within the mouth. The selection of either of these methods would depend upon the class of fixture used—that is, whether there be an external band or not. Next, the posterior corner alone may be affected by carrying the ligature from the posterior palatal hook outward to a band, carrying the corner out by its action.

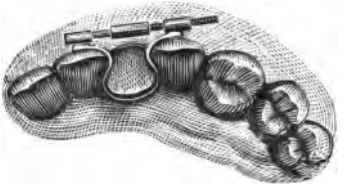
The cuspid is probably the most difficult tooth to twist, yet it can be accomplished. Make a gold cap for this tooth, upon which have the hooks for attachment of rubbers. This cap, like the band for the centrals or laterals, is made at the chair, without recourse to dies or models. Cut the gold into a shape similar to

an hour-glass. When doubled by bending across its shortest diameter, we already have an approximate cap. This is slipped over the tooth, and burnished to it, after which the open edges are soldered. together. An accurately fitting cap can be made in this manner in a few minutes without going to the laboratory. The hooks are formed of a round wire, the ends being pelted to form knobs, and then soldered across the cap. This allows all the variations of attachment of ligatures and direction of rotation described in connection with the incisors.

## REGULATING APPLIANCE.

DR. B. H. CATCHING, ATLANTA, GA.

This represents cases frequently seen: including superior lateral incisors. The cut is of the teeth of a robust young man, strong and firmly planted in the jaw. Without extraction the appliance moved the adjoining teeth laterally and brought the malposed tooth into position in two weeks. The same appliance was used as a retainer. No plate or caps were used to separate the jaws so as to allow the malposed tooth and its antagonist to pass. The patient operated the



appliance by using a wrench, and had instructions to tighten the screw to his bearing capacity just before retiring at night. In this way, when the cutting edges of the opposing teeth came togther, the upper was easily thrown outside the lower.

Material used, German silver wire, solid and hollow. A thin band is made to pass behind the malposed lateral and between the two adjoining teeth; to the end of this resting on the cuspid, as shown in cut, a piece of hollow wire is soldered, in which threads are cut to accommodate the screw; on the other end, resting on the

central incisor, a piece of hollow wire, with the outer end closed, is soldered; this acted as a socket into which the end of the screw without threads entered. A piece of hollow wire, as shown right over the malposed tooth, is soldered to the screw bar and filed square, so as to engage the wrench. When the screw became exhausted, the band under the malposed tooth was cut, lapped and soldered.

# DENTAL MEDICINE.

## LOCAL ANESTHETIC, TROPACOCAIN.

DR. A. C. HUGENSCHMIDT, PARIS.

Dental Cosmos, March.

This anesthetic Dr. H. reports as allied to cocaine. It is obtained from a plant of the coca family in Java. He says this new product will replace cocaine as it is a synthetical product, and much less likely to vary, thereby producing different results from day to day. His formula is:

Tropacocain hydrochlorate, 2 grains.
Distilled water, gtt. l (50). M.
S.—Gtt. x for one local anesthesia.

The advantages, he says, over cocaine are:

Used in an equal dose sufficient to produce local anesthesia, the new drug is much less toxic than cocaine, and has a very slight action on the vital functions of the economy. It produces a local anesthesia more rapid and more pronounced than cocaine, and of at least as great a duration. The solution of the salt being an antiseptic, as was pointed out by Chadbourne, can be kept for several months without decomposition, while after a few days a cocaine solution is worthless for injections.

## PARTIAL ANESTHESIA WITH CHLOROFORM.

DR. A. C. HEWETT, CHICAGO.

Dental Review, June.

The writer says he gets excellent obtundent effects from chloroform administered as follows: In a wide mouth half ounce or ounce vial put a teaspoonful of the drug. Place it near one nostril of the patient; close the other with the finger. Have the patient to breathe full and free. Remove the bottle at each expiration to

allow the exhaled air to escape. The bottle can be neared to the nostril as long as regular breathing goes on. When the eyelids "wink lazily" he operates. The precautions against hearty eating before the operation and tight clothes are to be guarded against. Only the obtunding effect of the chloroform is desired, not full anesthesia. The patient will know but not feel.

## LOCAL ANESTHESIA WITH CORYL.

MR. D'ARGENT.

Odontologie, April.

Coryl is a new refrigerating local anesthetic, a mixture of chloride of methyl and chloride of ethyl. It is less powerful than the first, hence not liable to produce eschars, and moreover is more powerful than chloride of ethyl and produces a state of deeper insensibility than the last. Coryl is a colorless liquid of an ethereal odor and taste (boiling at 0° C.); it is obtained by a methylation of

chloride of ethyl; it is inflammable as the latter. This compound is kept liquid under a pressure of three atmospheres in a recipient which has received the name of "Coryleur," which is a small nickel-plated metallic tube, easily managed, bearing a stop-cock, which allows the regulation of the escape of the compound. In using this apparatus it must always be kept upside down, as shown by the figure; it will produce complete local anesthesia in fifteen to twenty seconds. To apply the coryl the patient must be asked to breathe by the nose and not by the mouth; he must then rinse his mouth with water at the temperature of the room, the gum must be dried and the jet of coryl thrown on the gum below the

tooth to be extracted, beginning by the apex of the root, carrying the jet up towards the neck, then over the crown and down on the inner side of the alveolus, up to the end of the root, then coming back again over the same parts, doing this for fifteen to twenty seconds when the anesthesia will be found complete. To obtain a deeper and more prolonged state of insensibility, as soon as a first application of coryl is made the mouth must be quickly rinsed with water, then a second application is made, followed by another rinsing of the mouth, and finally a third application, when the anesthesia will be found to last over forty minutes.

## BROMIDE OF ETHYL AS A GENERAL ANESTHETIC.

DR. SAUVEZ.

Odontologie, May.

Bromide of ethyl has been used by the author in over one hundred consecutive cases in dental surgery without the slightest alarming symptom, the most difficult extraction having been performed while the patient was under its influence. The anesthesia, which is a complete one, is obtained in about half a minute and requires no special apparatus like nitrous oxide; but the bromide of ethyl requires to be chemically pure.

The patient is placed in an operating chair, in the operating position, while his mouth is kept open by means of a rubber separator or gag. The bromide of ethyl is then poured on a funnel-shaped napkin, the whole quantity required at once, that is from 8 to 12 grammes (ʒ ij. to ʒ iij.); it is then brought rapidly to cover absolutely the nose and mouth and the patient is asked to take deep breaths. In from twenty-five to forty-five seconds the operator will find that the patient's head can be more easily moved from one side to the other, when pushed by the hand; that is, one cannot say that the patient is in a state of muscular relaxation. He will not slide down from the chair, but he "just lets himself go." This is the time to operate. The inhalation must by all means not be carried beyond one minute. The anesthesia lasts from thirty seconds to three minutes.

# ANESTHESIA, A NEW APPARATUS FOR MAINTAINING, WITHOUT A FACE-PIECE, AND WITH THE MOUTH OPEN.

DR. THOMAS FILLEBROWN, BOSTON.

International Dental Journal, O tober.

This apparatus consists of a bellows, connected by rubber tubing with the long tube of a twelve-ounce wash-bottle, with a stop-cock intervening to regulate the flow of air. From the bottle extends a half-inch rubber tube to the patient. The bottle is filled one-third full of ether. The bellows is inflated and the stop-cock opened so as to allow the air to bubble up freely through the ether, and to become saturated with ether vapor. The etherized air is then discharged through the second tube a few inches from the patient's face.

This application of ether will maintain complete anesthesia for any length of time, and not interfere in the least with any operation in or about the mouth; nor will the surplus vapor discharged into the air sensibly affect either the operator or the assistants.

He has maintained perfect anesthesia for half an hour in one case to one and one-half hours in another case, without intermitting the operation at all on account of the anesthesia. This method is not wasteful of ether, as less than one-half pound continued the narcosis the hour and a half; but the waste should consider of no account as compared with the great advantage gained.

He has made a still further modification of the instrument, and adapted it to the induction of initial anesthesia, and its maintenance with face-piece for use in general surgery.

All ether inhalers now in use allow all the exhalations to be forced back into the instrument; consequently the patient breathes over and over again the same atmosphere and becomes more or less asphyxiated, instead of truly anesthetized. Such a plan seems to me unscientific, uncleanly and unhealthy, in every way undesirable.

To avoid this condition, he has attached to the discharged-tube of the apparatus above described a double-valve face-piece, such as is used for the administration of nitrous oxide, and a double-end

gas bag for a reservoir. By this means the patient is insured an abundance of pure anesthetic atmosphere for each inhalation.

At the suggestion of Dr. T. M. Dillingham, he first filled the bag with pure air, and by slowly injecting the etherized air, narcosis is induced with absolute freedom from any of the disagreeable symptoms usually experienced when etherization is accomplished. But has since found that the same object is better accomplished by raising the tube in the bottle until it is entirely free from the ether, filling the bag, and commencing the inhalation. In this air there will be but a very little ether. Then gradually slide the tube down into the bottle, and as it approaches the ether the strength is increased; after one-fourth of a minute the patient can breathe the full strength.

If the mouth is to be operated on, when anesthesia is complete disconnect the bag and face-piece and proceed as before described.

## LOCAL ANESTHETIC.

Dental Office and Laboratory, March.

℞ Tincture aconite ..... ℥ iss.
Pyrethri ..... ℥ iij.
Veratrinæ ..... gr. x.
Morphia, sulphate ..... gr. iv.
Rectified spirits ..... ℥ iv.
Hydrate chloral ..... gr. iv.

Macerate for four days and then filter for use. It is used by wiping the gums dry over the tooth to be extracted, and applied for a minute or more before extraction.

## PHENATE COCAINE AS LOCAL ANESTHETIC.

DR. C. B. ATKINSON, NEW YORK.

Dental Cosmos, January.

He uses the phenate of cocaine topically, not by hypodermic injection. The method followed is to dry the gum about the tooth

and apply a small pledget of absorbent cotton wet with the phenate of cocaine in fifty per cent. alcoholic solution.

This is left in contact as nearly as possible all about the tooth, with a caution to the patient against swallowing saliva; not because a poisoning influence is feared, but to avoid the numbness of the throat which follows upon the application of the phenate of cocaine to all soft tissues. One tooth at a time only has been treated, and for extraction it is not intended to claim complete anesthesia, but a great control of pain.

## DeKAY'S LOCAL ANESTHETIC.

Dental Register, April.

He has used for some time a local anesthetic for the extraction of teeth, which always acts promptly and is prepared as follows:

℞ Olei gaultheriæ ..... ℥ ij.
Chloroformi ..... ℥ j.
Ether sulph ..... ℥ j.
Chloral hydrat ..... ℥ ij.
Olei caryophilli ..... ℥ iv.
Alcoholis ..... ʒ iss.

M. Sig.—Apply with cotton, pressed upon each side of the tooth.

## LOCAL ANESTHETICS.

DR. A. W. HARLAN, CHICAGO.

Dental Review, October.

Menthol ..... 2 parts.
Ether ..... 15 parts.
Chloroform ..... 100 parts.

M. Sig.—For injection or used on a cotton rope around a tooth. Sometimes I have used it before removing deposits from the roots of teeth. Another good one is:

Tinct. cannabis indica ..... 2 parts.
Oil cassia ..... 1 part.
Acid carbolic ..... 3 parts.
Alcohol ..... 5 parts.

M. Sig.—Use as above.

## LOCAL ANESTHETIC.

DR. W. T. MARTIN, YAZOO CITY, MISS.

Hydr. cocaine ..... grs. x.
Sulph. atropine ..... grs. $\frac{1}{10}$.
Aqua dist.,
Listerine ..... āā ℥ iv.

Sig.—Inject into surrounding soft tissues hypodermically five to twenty minutes.

## HEWETT'S LOCAL ANESTHETIC.

DR. A. C. HEWETT, CHICAGO.

Dental Review, June.

℞ Cocaine hydrochlorate ..... gr. cxx.
Atropinæ ..... gr. $\frac{1}{10}$.
Strophanthin ..... gr. $\frac{1}{5}$.
Betanaphthol ..... gr. x.
Ol. caryophilli ..... ℥ ii.
Ol. cajuputi ..... ℥ ii.
Glycerine ..... ad ℥ i.

M. Sig.—Use with applicator as local anesthetic.

To apply, first bathe the gums surrounding the teeth to be extracted with alcohol and hydro-naphthol to remove mucus and all foreign substances from the gums and membrane surrounding tooth neck and roots. This is important. With warmed wax or modeling compound take an impression of the teeth or roots. Remove from the mouth and slightly enlarge and deepen the impressions of the several teeth or roots to be drawn. Place a small pledget of absorbent cotten dipped in the pigment in the enlarged tooth and root impressions, and carry to the mouth, which, after the alcohol, should be made as dry as possible. Press firmly up and hold there five or ten minutes.

## COCAINE ANTIDOTE.

Dental Cosmos, July.

Dr. J. H. Kennicott says strong coffee has acted admirably, while other remedies failed.

## COCAINE ANESTHESIA.

DR. D. CARACATSANIS, ATHENS, GREECE.

Dental Cosmos, September.

The operation is simple, within the power of every one; its only imperfection is that its application demands considerable time; sometimes as much as three-quarters of an hour is required for complete anesthesia. The procedure is as follows: Begin painting the gum, next the tooth to be extracted, with a steel instrument wrapped in cotton dipped in a solution of phenic acid, 2 to 1000, which is heated. This is followed by the application of the salt of cocaine by means of a pledget of cotton impregnated therewith. As soon as the gum shows signs of insensibility commence to separate it slowly from the tooth by means of a bistoury. Insert into the space thus effected pledgets of cotton impregnated with cocaine as before. As the anesthesia advances enlarge the opening to a depth of about one centimeter, on the buccal as well as on the lingual surface. Direct the patient to abstain from swallowing the saliva, to avoid all absorption of cocaine. Take good care not to forget the cotton pledgets placed between the gum and the tooth.

After assuring yourself by strongly making pressue on the parts with a steel instrument, have an assistant to spray the parts with a mixture composed as follows:

| | |
|---|---|
| Chloroform | 25 grams. |
| Sulphuric ether | 40 grams. |
| Menthol | 3 grams. |
| Cocaine | 1 gram. |
| Essence of mint | 1 gram. |

Extract while the parts are being sprayed. The resulting anesthesia is absolutely complete; the only condition in which he has failed to produce it being the existence of inflammation or periostitis.

## COCAINE ANTIDOTE.

Dental Review, June.

The best antidotes for cocaine poisoning are: Ammonia, nitrite of amyl—ether inhalations to keep up respiration. Do not inject more than three-quarters grain cocaine hydrochlorate combined with a two or three per cent. solution of resorcin.

## COCAINE, FOUR PER CENT. SOLUTION, MAKE AND KEEP.

DR. A. C. HEWETT, CHICAGO.

Dental Review, June.

| | |
|---|---|
| Cocaine chor. hydrate | grs. xxxviii. |
| Glycerine | ℥ ii. |
| Water, pure | ℥ ii. |

## COCAINE INTOXICATION, HOW TO TREAT.

M. C. ELROY.

Revue de Clinique.

Your first duty is to prevent syncope, afterward to combat respiratory and cardiac collapse. The therapeutic means of doing this are unfortunately very few. At the very beginning place the patient in a perfectly horizontal position, which will diminish the force of the syncopal condition. Srpinkle ice-water over the face, and to prevent convulsions envelop the body in cloths wrung out of cold water.

If asphyxia threatens, practice flagellations with wet towels, massage, artificial respiration.

Against tetanization of the respiratory muscles give inhalations of chloroform.

Where there is great pallor, provoke vaso-dilatation, modify the arterial pressure, and diminish the encumberment of the central circulation, by the administration of amyl nitrite (by inhalation).

If these means prove ineffectual, and deglutition is impossible, give hypodermic injections of caffeine and of sulphuric ether (15, 30, even 45 minims).

In a word, bend your efforts toward moderation of reflex excitability of the nervous system, sustain the heart, and re-establish the equilibrium of the blood-pressure. The treatment of acute cocaine intoxication is particularly and above all a case for arterial medication.

Commenting on the foregoing, M. Chouppe (Bulletin Medical) counsels in addition the use of hypodermic injections of morphine.

These should be given only in the very outset, however, and should be only sufficiently large to produce the physiological effects of the drug, say from one-half to five-eighths of a grain.

## COCAINUM PHENYLICUM.

Zahntecnische Reform.

This has been recommended in the place of cocaine muriate. It is a light colored substance, resembling thick honey. It melts readily and contains seventy-five per cent. of the alkaloid cocaine. It dissolves in alcohol (thirty to fifty per cent.), is used locally in a strength of from one-tenth per cent., and appears to have the same qualities of carbolic acid.

## COCAINE ANESTHESIA, RESTORATIVES.

DR. N. S. HOFF, ANN ARBOR, MICH.

Dental Register, March.

While it is true, there is no agent which will secure for us such prompt and effective results, there is also no drug capable, if carelessly or ignorantly used, of doing so much actual harm. In practical use we find the preparation known as the hydrochlorate is to be preferred. This is obtained in its best condition in the form of crystals, and as a convenience in one-half grain capsules, or compressed tablets. Two per cent. solutions should be made with carbolated distilled water, a two per cent. solution. Cocaine alone is best used in a two per cent. solution for local anesthesia. The addition of carbolic acid to the distilled water helps to render the solution antiseptic and also limits the absorption of the cocaine into the general circulation, thereby localizing its action. If higher percentage solutions are used, some agent which will counteract the paralyzing effect of the cocaine on the heart and respiration should be added. The most effective agent of this kind is the sulphate of atropine. This is a valuable addition to the formula not only for its antagonistic effect but it also increases the local effect by paralyzing the nerve endings in the tissues involved.

In order therefore to construct a formula which will meet the

demands of local anesthesia and be safe to use, four elements at least are necessary, viz: the basis, the adjuvant, the corrective, the diluent. And as an illustration we will compound the following formula, making a two per cent. solution of cocaine:

℞ Cocaine hydrochlorate..... grains x—basis.
Sulphate of atropine.....grains 1-10—corrective.
Carbolic acid, 95 per cent. solution..gtts. viij—adjuvant.
Distilled water.....ʒ j—diluent.

Dissolve carbolic acid and atropine in the water and to every twenty-five drops add one-half grain of cocaine. When wanted for use, other drugs may be added to this formula to increase or intensify the effect of the cocaine, but in my judgment chloral, camphor and aconite, which are usually employed, do not materially increase the power of the formula, while it is quite certain that they do cause an excessive irritation that is somewhat difficult to control. Chloral is especially apt to cause this irritation, and in some cases it will produce excessive swelling or even sloughing of the gums. To increase the power of the formula I should prefer rather to increase the amount of cocaine up to a three or four per cent. solution. The amount of this formula that can be safely used at one time can be determined by remembering that one-half grain of cocaine is a safe dose for a hypodermic injection and that one two-hundredths to one-sixtieth of a grain of atropine can be safely injected. And since the atropine and cocaine neutralize each other in their pyhsiological actions, a dose of each given at the same time must be safe. The carbolic acid in the quantity indicated is not at all dangerous and consequently we would be justified in using hypodermically twenty-five drops of the above solution. But practically it will not generally be necessary to use more than ten or fifteen drops, unless a great many teeth are to be extracted. This formula is selected only as a basis or a study as it were, but it will be found useful in its present form. It is hoped, however, that this subject will be investigated both clinically and scientifically.

A few words as to the use of the syringe. The syringe should be in perfect order, and means for sterilizing the needle should certainly be used. Before introducing the needle into the gum it should be dipped into a strong solution of carbolic acid, and then washed in a five per cent. solution of the same, which should not

be wiped off, but if a drop remains on the point when it touches the gum, it will paralyze the tissue so that the needle will not hurt when inserted. Insert the needle just below the margin of the gum and press gently and slowly into the deeper structures, and then slowly force the cocaine solution into the tissues, allowing time for its absorption. Remove needle and insert on the opposite side of the tooth, and repeat the process as often as necessary, depending on the extent of the operation. Each time after removing the needle press the finger firmly over the opening left by the needle to prevent escape of the cocaine. Allow two to five minutes for complete effects and operate.

To provide for any emergency such as fainting or collapse from the anesthetic or shock, restorative agents should always be near at hand. Spirits of ammonia: Take a wide-mouth, tooth-powder bottle and place in the bottom a piece of absorbent cotton and saturate or dampen with ammonia; cork with a rubber stopper and keep in the medicine chest; it will come handy some time. Also keep some nitrite of amyl in little glass flasks or "tears" as they are called. About three drops in a little glass globule. In case of profound collapse break one of these tears in a handkerchief or small napkin and allow patient to breathe not over three times. It is a powerful heart stimulant.

## TROUBLESOME NAUSEA IN PLATE MAKING AND WEARING.

DR. C. E. KLOTZ, ST. CATHERINES, CANADA.

Dominion Dental Journal, May.

Dr. Klotz records a most remarkable case of nausea, produced by even the mouth mirror. He had to make a plate for the patient. By washing the mouth and gargling with bromide potash, he succeeded in getting an impression. The same was used before introducing the trial plate; but the remedy failed when the finished plate was to be inserted, so he painted the mouth with a twenty per cent. cocaine solution. This answered for awhile, when the trouble

returned. He then used the following as a spray, and gave the patient instructions to spray his mouth every morning and evening for a week, after that only when nausea returned. His last report was that several months had passed without use of the spray:

℞ Cocaine ..... grs. vjjj.
Syr. tolu ..... ʒ ss.
Whisky ..... ʒ jjj.
Water ..... jj.

## BICHLORIDE OF MERCURY AND CHLORIDE OF ZINC IN TREATMENT OF PULPLESS TEETH AND ALVEOLAR ABSCESS.

DR. FRANK ABBOTT, NEW YORK.

International Dental Journal, August.

It is, I believe, a well established fact in the minds of most pathologists that any substance, claimed to be a germicide, is much more effective when greatly diluted than in its pure state. This is due, probably, to two facts: first, the diluted remedy is more readily absorbed by the diseased or dead tissue, the parts becoming almost immediately upon its application saturated with it, while the pure substance is absorbed very slowly; secondly, in the process of imbibing nourishment the organisms take the diluted remedy because there is no uncontaminated nourishment at hand for them to live upon. Consequently they take this and die rather than die of starvation. Thus it is that a solution of carbolic acid of 1 to 100 is classed as an effective germicide; creosote, 1 to 200, etc.

Many remedies have been introduced to the medical profession of more or less value as antiseptics, and with which good results are accomplished, but none of them are considered to-day as equal in destroying germ-life and arresting putrefaction to bichloride of mercury.

One special advantage this remedy possesses is its ability to accomplish the results desired in so greatly a diluted state. It is

claimed to be a germicide when diluted to 1 to 100,000 parts of water. To use it, however, so weak in the pulp-canals of teeth would probably prove unsatisfactory, in consequence of the presence of more or less liquid in the canals, which would further dilute it and render its action nil. Another great advantage in its use lies in its odorless quality. A solution of 1 to 10,000 of water is almost as tasteless and odorless as the water alone, and still this strength will do all that is desired, and may be used freely in the teeth, with no possible harm to the patient. At the same time it is strong enough, even if it is more or less diluted by the liquid contents of the canals, to do the work desired of it. From the almost positive results in the use of this remedy in the treatment of pulpless teeth, I am led to believe that it not only destroys all organisms, but renders ptomaines, if any are left in pulp-canals, harmless. This, I take it, is the result of a chemical change that takes place when the solution of bichloride and the ptomaines meet, rendering the ptomaines inert. The method practiced in the treatment of these cases, where no visible abscess is present opening upon the gum, and to which I wish especially to call attention, is as follows:

After the contents of the pulp-canals are stirred and all removed that can be with an instrument that plays freely in them, a solution of 1 to 10,000 of bichloride of mercury is thrown into them by means of a small gold-pointed (Farrar) syringe. This stirring and washing is repeated until the operator is satisfied as to the cleanliness of the canals; then, in most cases—not in all—a very small bit of cotton is carried to the distal end of the canal and packed tightly, plugging the foramen.

It will be observed that up to this stage of the operation, when everything is ready for the introduction of the filling material, the canals have not been drilled out, nor any attempt made to dry them; the cavity in the crown and the pulp-chamber are dried, but the canals proper have been made aseptic, and the antiseptic is allowed to remain and mix with the filling material, which is immediately introduced into the canals (unless periostitis is present, when, if it is, a day or two of treatment will usually relieve it.)

The filling material consists of oxychloride of zinc, with one drop of a solution of 1 to 2,000 of bichloride of mercury mixed with it. The final operation upon the crown of the tooth is im-

mediately done and finished. The addition of the bichloride solution to the cement is made in order that the effect of its constant presence may be assured. As a precaution the gum over the tooth is then painted with "antiphlogistine" (concentrated tincture of aconite root and tincture of iodine, equal parts). This mode of treatment has been followed by the writer altogether for some two or three years, and in some cases it was done by him as long ago as seven or eight years. It was the success in the treatment of these cases, and a careful study of the subject, that has resulted in adopting the method altogether.

In many cases, I might say nearly all, when the canals are being filled, the filling material or the liquid (chloride of zinc) is forced through the foramen, and, coming in contact with the living tissue at the end of the root, produces, through its escharotic action, slight pain, which usually lasts from fifteen minutes to an hour.

Let us consider for a moment what advantages are gained by this over that of the protracted treatment so generally followed.

If a pulp-canal is left open and treated occasionally, the gas that generates in the process of putrefaction of the contents of the dental canaliculi must escape into it, as it has no other exit. The canal very soon becomes filled with it, so that both mechanically and chemically it acts upon and irritates the living tissue at the end of the root of the tooth, so that every day sees the case complicated with perhaps pain, perhaps suppuration and discharge of pus through the canal. This condition may, and in many cases does, continue for days, weeks, and sometimes even for months before it seems at all safe to fill it. All this is obviated in the treatment above described, consequently it should commend itself to all dental practitioners.

Should any periosteal disturbance follow the operation, by again painting the gum once or twice with the above-mentioned remedy it subsides, and the tooth becomes as comfortable as it was before exposure of the pulp. Such trouble, however, seldom occurs, the one painting before the patient leaves the chair usually being all that is required.

The treatment of teeth with abscesses is proceeded with in the same general way as far as cleansing and the use of the bichloride is concerned. After this has been thoroughly done, a solution of

twenty grains of chloride of zinc to one ounce of water in ordinary cases (forty to sixty grains in chronic cases) is forced through the canal and abscess until its presence upon the gum is indicated by the characteristic white coagulated albumen. The canals and crown are then filled and finished as before described, except that no cotton is placed in the canal before introducing the oxychloride mixture.

The advantages gained by this mode of treating alveolar abscesses over that so generally practiced must be apparent to every practitioner.

The chloride of zinc possesses properties which no other remedy does that I am familiar with, that make it one of the most valuable, if not the most valuable, agent known in the treatment of this troublesome disease. It mingles or mixes freely with the liquid contents of the abscess, does its work (destroys the lining membrane of the sac) with very little pain, and its powerful astringent properties, together with its highly stimulating effect, serve to almost immediately produce healthy granulations, which in a few days results in closing the cavity at the end of the root and the healing of the opening in the gum.

I am aware of the confidence many practitioners reposed in carbolic acid, creosote, iodoform and other escharotic and antiseptic agents in the treatment of alveolar abscesses. I used them nearly all for many years, nearly always with unsatisfactory results. The lack of the necessary escharotic properties, is due, perhaps, in a great measure to the fact that they become too much diluted upon entering the abscess proper, by mixing with its liquid contents, thus rendering them of little, if any, value as a destroyer of the lining membrane (pyogenic membrane) of the abscess. Consequently the sac remains to receive the migrating, colorless blood-corpuscles which constitute, after their death and partial decomposition, the pus which is constantly or periodically discharging through the opening in the gum.

The chloride of zinc, on the other hand, even if somewhat diluted, takes hold of this abscess sac so vigorously that its lining membrane is almost immediately destroyed, and it will in a short time (two or three days) break down, and discharge in the form of pus.

Should the canals be left open after its use, or that of any

other remedy, the gas from the putrefactive process going on in the canaliculi will very shortly re-establish the abscess, so that the treatment must be repeated over and over again, each time with varying degrees of success or failure.

Alveolar abscesses differ from those in soft tissue in that there is no repair taking place, even after evacuation. The bony walls being unyielding, and not containining sufficient organic tissue to exert pressure upon the abscess, and thus cause its obliteration, it remains, in most cases, for many years, or until the tooth is removed or an escharotic strong enough to destroy it is forced into it. Antiseptics, consequently, are of little use, except to prepare the parts for the most perfect action of the escharotic.

## OIL CAJIPUT.

This is an excellent solvent for gutta-percha. Dip gutta-percha points for root filling in it.

## AROMATIC CHLORO-ARISTOL.

DR. S. CLIPPINGER, TOLEDO, OHIO.

Dental Cosmos, August.

For the treatment of dead and infected teeth or roots of teeth, also for alveolar abscesses with or without fistula, is the name I have given to the following combination:

| | |
|---|---|
| Aristol | 1 drachm. |
| Chloroform | ½ ounce. |
| Oil of cassia | 10 minims. |

Owing to its gummy nature, it cannot be used with a syringe, but with a smooth broach wrapped with cotton fibers it can be very readily forced through the root-canal, after properly enlarging it.

A blind abscess at the apex of a root can thus be successfully treated, even where there is no drainage; in fact, there is no need of drainage, one or two applications being all that is needed. One application is all that is needed for an infected root-canal, and it is a capital dressing for an exposed nerve before capping it.

## TRICHLORACETIC ACID.

This preparation is highly recommended for Riggs disease. It is sometimes used in connection with pyrozone. The treatment of this disease with any remedy necessitates a thorough cleaning of the roots, and attention to the alveolar border. A ten per cent. strength will be sufficient, though a stronger solution may be used.

Dr. E. C. Kirk says to make sure that the roots are freed from tartar, he distends the pockets and bathes the surfaces with the acid, which prevents oozing for a sufficient length of time to allow a glance at the root-surface.

He also recommends the acid, full strength, for treating gum-polypi, so often found in badly decayed first molars in children's mouths. The growth is touched repeatedly with the medicine, which being escharotic acts readily and rapidly.

Dr. Ottolengue reported a case of alveolar abscess in which he used trichloracetic acid crystals for the purpose of opening through the gum to the end of the root. One crystal was placed in the fistula which destroyed the tissues; this was followed with two more. Soon an opening was made to the end of the root sufficiently to allow the end of it to be scraped clean.

He recommends the acid for removing overlying gum of third molars. It burns away the tissue, he says, without hemorrhage or subsequent soreness.

Dr. C. N. Peirce, says where you have a spongy condition of the gums which you desire to remove, or a growth over a third molar, or any condition of that kind, it is the most appropriate application that can be made, by simply taking a little wooden spatula, saturating it, and rubbing it over the tissue. It is a powerful escharotic, and in one or two applications you will remove the abnormal growth. Again, where you have the little nodules of calcific deposit on the roots of the teeth, with the same little wooden spatula you pass down into the apex and cleanse off the surface of these roots. He has no hesitation, wherever there are calcific deposits, in using this acid, even in its full strength, in that way. It cleans off the root thoroughly. After you have used your scalers, use this and it will remove every vestige of the calcic deposit. Then, again, it has a very happy result on the tissues themselves. Being a powerful escharotic and astringent, you will find that an

application into the pocket will arrest the accumulation of pus that is so common, with one or two applications. He has had very desirable results from its careful use in all the cases of pyorrhea of this nature. Has no hesitation, if he opens into the root of a tooth, to dress the pulp by taking a little circular spatula and forcing it up into the root; the acid will destroy the tissue, and purify the root, in a moment's time, more perfectly than you can with carbolic acid.

Dr. A. W. Harlan says, the trichloracetic acid is very useful for the solution of those particles of sanguinary deposits on the roots of teeth that are almost inaccessible. It is useful as a stimulant and astringent, and to check the formation of pus on the mucous membrane of the mouth, and is a very excellent refrigerant mouth-wash in all inflamed conditions of the mucous membrane. As a mouth-wash, use one-half to one per cent. in water. It is freely soluble in water, and for the removal of deposits on the roots of teeth a ten per cent. solution in water may be used, and it may be followed by magnesia, sodium, silicate, or any solution that you may have handy.

## NITRATE OF SILVER PREPARED FOR USE.

International Dental Journal, February.

Dr. C. N. Peirce saturates blotting paper in a forty per cent. solution of nitrate of silver. He says it can be applied to children's teeth without the direct application of the crystal, which is always attended with some danger, and liable to stain the fingers, napkins and instruments.

This preparation seems to work very happily, and is of abundant strength for all purposes required in the mouth, whether for cauterizing the soft tissues or acting on the hard. It is well known that nitrate of silver is very soluble, dissolving in its own weight of water. This strong solution he tried first on some short fiber of cotton, but found, when dried, that the cotton was entirely destroyed. This strength—forty per cent.—is about as strong as can be used without some destruction of the fabric. The pad, thus prepared, can be cut into small pieces, and be always ready for use, if kept dry.

Dr. W. C. Barrett suggests the use of asbestos paper or felt,

instead of blotting paper. A stronger solution of the silver can be used without effect on the asbestos.

For removing the effects of nitrate of silver on the mucous membrane, Dr. B. F. Arrington, in Southern Dental Journal, says use strong salt water.

## BORICINE.

MR. EMILE DENIS.

Odontologie.

Boricine is a combination of equal parts borax and boracic acid. This tetraborate of sodium is neither caustic, toxic nor irritant, has no odor and gives a saturated solution at sixteen per cent. The author has not found much advantage in its use as a disinfectant of root canals, but has obtained surprising results in treating mucous membranes. In a case of abscess of the maxillary sinus, the cavity was syringed out twice a day with a sixteen per cent. solution of boricine, while after the syringing about a teaspoonful of the powder was allowed to penetrate into the sinus; in five days all trace of infection had disappeared.

## EUROPHEN; ITS USES.

DR. A. W. HARLAN, CHICAGO.

Dental Cosmos, January.

When applied in powder to gingival inflammations produced by the setting of crowns and bridges it promptly and efficiently reduces the swelling and soreness, and is equally efficacious in mucous patches on the cheek or tongue of syphilitic origin. Applied to a suppurating or inflamed pulp, it quickly subdues the pain. He uses it in powder rubbed up with lanolin, twenty-five parts of europhen to seventy-five parts of lanolin. He has also found this paste useful in excoriations around the corners of the mouth and nose, in inflamed sore mouth under metallic or rubber plates, and as an after-dressing for pyorrhea pockets. He earnestly commends europhen as a parasiticide, and thinks it possible it might be useful

as a dressing in empyema of the antrum. It is an agent that is destined to take the place of iodoform; it is almost non-odorous, non-poisonous, five times lighter, and will answer admirably for all the purposes for which iodoform has been used.

## PAIN AFTER EXTRACTION, HEADACHE, NEURALGIA.

Western Dental Journal, June.

A potent and reliable remedy for the immediate after-pains of tooth extraction, whether general or local anesthetics are used or not, is amyl nitrite. The patient to inhale the preparation about three or four seconds, and then to sit still in the chair for about five minutes, or until the amyl nitrate has spent its primary force. As a matter of fact, the remedy should be kept in every office, dental and medical, where anesthetics are used. A single drop of nitroglycerine, one per cent. solution, in half a glass of cold water, is even better than amyl nitrite, and more lasting in its effects. Both remedies are of marvelous benefit in neuralgias of all kinds, and both will oftentimes cure the bad headache following dental operations. In angina pectoris, one of the most dreadful of all cardiac affections, nitroglycerine is almost a specific so far as relief of pain is concerned, although not curative of the frightful malady. Intense fear, such as is exhibited by nervous patients in visiting a dentist for tooth extraction, will sometimes bring on an attack of angina pectoris in patients with weak hearts; hence it behooves the dental surgeon in full practice to be prepared for emergencies of all kinds, and to be able to cope with them successfully when he meets them.

## PAIN AFTER EXTRACTION.

MR. R. E. NICHOLLS.

British Journal Dental Science, January.

Pain after extraction is usually brief and soon subsides unless there has been periostitis, or where septic forceps have been used. Where there is no inflammation the pain is frequently due to a

bending or fracture of the alveolar walls, so that the periosteum is torn or stretched. This would be obviated by pressure of the thumb and finger on each side of the socket immediately after extraction; this, by the way, is a constant practice with many dental surgeons, and is said to lessen hemorrhage.

In all cases of pain after extraction, the vacant socket should be sponged out with a loosely rolled pledget of cotton steeped in soda-phenique, or in the following substitute:

Acid carbol. glac. ..... ℥ i.
Liq. potasse. ..... ℥ i.
Aqua. ad. ..... ℥ viij.

This will usually give great relief, and the cotton may be suffered to remain a day or two if the pain tends to return on its removal. Usually one or two applications will dispel the severe pain, so that the cotton need not be left in the socket.

## KALODONT DENTIFRICE.

PROF. CALI, NAPLES, ITALY.

Agenda M. C. Odontojatrica.

This tooth paste, so widely used in Europe, is easily prepared as follows:

Precipitated chalk ..... 1 part
Powdered soap ..... 1 part
Glycerine ..... 1 part

Mix well in a mortar, color with carmine, flavor as required.

## SAPONACEOUS TOOTH POWDER.

Precipitated chalk ..... 4 oz.
Powdered myrrh ..... ¼ oz.
Powdered orris-root ..... ½ oz.
Powdered Castile soap, white ..... ½ oz.
Oil of peppermint ..... 5 drops.

## ALKALINE ANTISEPTIC TOOTH POWDER.

Dental Review, June.

| | |
|---|---|
| Precip. chalk | 28 ozs. |
| Powdered Castile soap | 8 ozs. |
| Acid. salicylic | 20 grains. |
| Sodium bicarb | 1 oz. |
| Sodium borate | 1 oz. |
| Sodium benzoate, Sodium salicylate, Sodium chloride | āā 20 grains. |
| Eucalyptol | 10 minims. |
| Thymol | 10 grains. |
| Menthol | 5 grains. |
| Oil wintergreen | 2 drams. |

## SAPONACEOUS MOUTH WASH.

Dental Office and Laboratory, November.

| | |
|---|---|
| Castile soap (white) | ½ oz. |
| Oil of peppermint | 5 drops. |
| Oil of wintergreen | 12 drops. |
| Glycerine | ½ oz. |
| Water | 1 oz. |
| Alcohol | 2 ozs. |
| Cochineal tincture | sufficient to color. |

## LYSOL WASH.

Dental Review, May.

| | |
|---|---|
| Lysol | ℥ ss. |
| Water | ℥ xvi. |

The water may be still further diluted to use as a mouth wash. The writer takes of this stock solution, six drachms to four ounces of water for washing scalers, excavators, forceps, etc.

## ANTISEPTIC DENTAL CREAM.

Pharmaceutical Record.

| | |
|---|---|
| Precipitated chalk | ʒ v. |
| Powdered white soap | ʒ j. |
| Salicylate of soda | grs. xx. |
| Oil of rose geranium | m. iv. |
| Oil of wintergreen | m. iij. |
| Solution of carmine | m. ij. |
| Glycerine (4) } Water (1) } | q. s. |

Triturate the powders, add the oils and continue trituration until well mixed, then make into a paste of the desired consistency with glycerine and water mixed in the above proportions, add the solution of carmine, and rub all together until a smooth creamy paste results.

This makes an elegant dentifrice, and should be put up in white porcelain jars, or made more of the consistency of honey and put in tinfoil tubes.

## ASTRINGENT TINCTURE FOR THE TEETH AND GUMS.

British Journal Science, June.

| | |
|---|---|
| Myrrhæ | ʒ xij. |
| Rad. iridis | ʒ xij. |
| Benzoini | ʒ vj. |
| Cort. cinchonæ | ʒ viij. |
| Ext. krameriæ | ʒ j. |
| Capsici | ʒ j. |
| Spt. recitificat. | cong. ij. |

Macerate for seven days, and filter; to the filtrate add 30 oz. of simple syrup.

## FOR TOOTHACHE.

| | |
|---|---|
| Menthol | 5 parts. |
| Chloroform | 8 parts. |

Apply in the cavity on cotton.

## ASTRINGENT MOUTH WASH.

Items of Interest, April.

℞ Aq. dest ..... ℥ j.
Tr. kramaria,
Tr. catichu ..... āā ʒ iij.
Acid carbol ..... gtt. ij.
Aq. calcis ..... ℥ ij.
Aq. cologne ..... q.s.

## DEODORIZER FOR IODOFORM.

L'Odontologie, May-June.

Spirits of turpentine will remove at once the disagreeable odor of iodoform from the hands. Wash with soap to get rid of the turpentine.

## GINGIVITIS NUDATA.

DR. JOSZEF ARKÖVY, BUDAPEST, HUNGARY.

Dental Cosmos, October.

Having lately had the opportunity of observing a case of gingivitis nudata at the dental clinic under my charge, I wish to describe its general features. Its peculiar character would not have escaped the notice of any good observer, yet we do not find any account of this kind of gingivitis in dental literature. We have, therefore, to give not only a description but a name to this disease, to which, from its pathological character, we give the technical name of gingivitis nudata. Cases of it are very rare. In ten years, both in the clinic and in private practice, I have not been able to find more than eight or ten genuine cases. As in the case of many other newly discovered diseases, it is possible that here also cases will arise in increasing numbers as soon as its existence is generally known. As an example we give at length the most recent case observed.

Victoria S., girl, nineteen years old, sickly; for some weeks under treatment for chlorosis at the university clinic.

For three days the patient had been complaining of pains in

the roof of the mouth. She was transferred to the dental clinic on the 2d of May, 1893, for consultation and treatment.

Status Præsens.—The mucous membrane of the mouth of the chlorotic invalid is in general pale. The mucous membrane on the roof of the mouth and on the interdental papillæ is not smooth, but shows little grains hardly perceptible to the naked eye. The interdental papillæ, as well as the folds of the roof of the mouth, look as if they were swollen, are without luster, quite dry, and stick when touched with the tips of the fingers. The same adhesiveness can be shown by touching delicately with some light instrument—e. g., with a root-canal probe.

Etiology.—The cause of this disease is to be found partly in a scalding of the mucous membrane of the mouth; cases also have occurred in which it was not possible to discover the really active cause. The scalding cannot be regarded as the exclusive cause, since this assumption is contradicted by the rare occurrence of the disease, while men frequently scald their mouths. This cause is also not to be reconciled with the long duration of the disease. We have had the opportunity of proving a duration of one to two years. This was in the case of two women. One, fifty years old, suffered two years; the other, thirty-eight to forty years old, suffered about a year. On the other hand, it is well known that scalded spots in the mouth recover their epithelial covering in a few days. So far as the frequency is concerned, there are many more cases observed where this change in the labial surface of the gums (upper jaw) was due to immoderate brushing of the teeth. But here again the sore heals very quickly. It is very probable that mechanical stimuli could also contribute to the production of gingivitus nudata; and several cases were observed where the patients had artificial teeth (upper plates) in which the piece was either rough or did not fit exactly.

Localization.—The disease has its seat in the roof of the mouth, but sometimes spreads over the gums, involving the interdental papillæ, or it is limited to the latter. The boundaries of the surface affected cannot be made out with the naked eye, since the edges are not at all pronounced and do not show any deviation from the normal color. Touching offers the only means of recognizing the boundaries, by which means the extent of the disease is discovered in the lusterless and sticky mucous membrane. The

labial and buccal gingivæ are never found within the circle of the disease.

Pathological Nature.—If the change is observed by means of a microscope, it is noticed that the epithelial layer of the mucous membrane is entirely lacking on the diseased surface, and the Malpighian layer (papillæ) is exposed.

I have not yet had the opportunity to observe a stadium bullosum.

Symptoms.—These are evidenced by the continual burning—feeling of heat; further, by a sensitiveness to touch amounting almost to pain during and particularly after meal-times. In those cases where the disease was seen in connection with artificial teeth, the patients complained always after a continuous use of them, and on this account were continually taking the plates out of the mouth. In regard to the latter cases, we might suppose that besides the property of caoutchouc as a poor conductor of heat, some special and individual property of the mucous membrane of the mouth also plays a part, since every one knows that there are numerous cases of badly fitting plates where this kind of change (gingivitis nudata) does not occur.

Diagnosis.—This is made on grounds of etiology, localization and symptoms. The chief basis for a diagnosis is afforded by the denudation of the layers of papillæ of the mucous membrane, their adhesiveness and the feeling of burning.

Course.—The decisive cases observed were first seen at various periods of the disease; we could mostly suppose a process of a few weeks or two or three months; but there were cases which had lasted one to two years—a sign that the disease can continue to exist without healing spontaneously. In the latter cases, according to the account of the previous history of the disease, there were intervals of cessation of several weeks, after which the symptoms described reappeared. Where the region of denudation of the epithelium was greater the duration of the disease was shown to be longer, as might be expected. In regard to its course, the age of the individual seems to play no part, since in the year 1885 we had the opportunity of observing gingivitis nudata in the case of a twelve-year-old boy, which extended over half of the roof of the mouth and all of the labial and interdental papillæ. In the following years the two women before mentioned (forty to fifty years

old) were observed; the course was in both cases equally stubborn and enduring.

Therapy.—This consists in abstinence from the use of irritating agencies and foods. To counteract the irritation, slippery, mucilaginous medicaments or foods seem to be indicated. The patients must be ordered also to avoid foods that cause mechanical friction. The diet could therefore be arranged as follows:

Breakfast. Sago soup, lukewarm milk or coffee.

Dinner. Rice soup, or meat-broth with the yolk of eggs; omelet prepared with milk, with little or no salt; rice in milk; millet or groats thoroughly cooked; meat only as hash.

Supper. One of the meals given above.

Mucilaginous gargling water can also be prescribed, as: Decoct. tub. salep, or decoct. rad. althæ; an addition of some cocaine or formanilid seems to be of further benefit.

Taking as a basis the experiments mentioned, we tried this method of treatment on both of the patients named. The condition of the patient improved from day to day; on the fourth day the pain had entirely ceased, and the mucous membrane appeared again covered with a thin layer of epithelium.

This method of treatment or diet we tried to fit to the nature of the evil, and it is very probable that a surgical operation or any other kind of medical treatment, especially the application of astringents, would not only not lead to the goal, but make the condition of the patient still worse.

It would be of interest if decisive observations could be published from other quarters, particularly if some one should succeed in finding a quick and still effectual method of treatment which, in view of the lingering nature of this disease, would be of great benefit to the patients.

## ANTIPYRINE AS A HŒMOSTATIC.

Giornale di Corrispondenza pei Dentisti.

Antipyrine has been used successfully for the staunching of blood after extraction, by applying on cotton directly into the alveolus. It has none of the disagreeable effects of iron perchloride.

# GINGIVITIS, PERICEMENTITIS, FACIAL NEURALGIA.

DR. A. C. HUGENSCHMIDT, PARIS.

Revue Internationale d'Odontologie.

Dr. Hugenschmidt recommends in single gingivities, without ulcerations, accompanied by light generalized alveolar periostitis, for painting the gum once a day:

Tincture of iodine..... 5 parts.
Tincture of English aconite (Fleming).. 1 part.
Chlorhydrate of cocaine..... $\frac{1}{10}$ part.

When there are buccal ulcerations, besides alveolar periostitis the following mixture will give good results, and the absorption of the medicament is not to be feared:

Tincture of iodine..... 5 parts.
Tincture of belladonna,
Laudanum of Rousseau..... āā 2 parts.

M.—Apply on the gum with a pencil; the application is painful during a few seconds.

In facial neuralgia, a ball of cotton as a kernel and soaked in the following solution:

Menthol..... 3 parts.
Chloroform..... 5 parts.

In eruptions of the wisdom tooth, wash the buccal cavity with a solution of sublimate in one one-thousandth, scraping off the gum with a knife, to expose all the masticating surface of the tooth; then wash again with sublimate, and finally dress up with a ball of cotton charged with aristol and placed in the cavity formed by the gingival excisions; the patient must keep the mouth in an aseptic condition, during several days, and can himself renew several times a day his aristol dressings.

# FOR DENTAL HEMORRHAGE.

British Journal Dental Science, January.

Mr. J. S. Hughes recommends very highly Fletcher's carbolized resin, which is composed of resin and carbolic acid dissolved in chloroform. He says it will quickly relieve the pain after extraction. Also turpentine, he says, is most excellent.

## SPONGY GUMS.

PROF. CALI, NAPLES, ITALY.

Agenda M. C. Odontojatrica.

| | |
|---|---|
| Decoction cochlearia and quinine bark | 200 parts. |
| Sulphate aluminum | 3 parts. |
| Sulphuric acid | 1 part. |
| Syrup roses | 30 parts. |

Apply with a camel's hair brush.

## DENTAL HEMORRHAGE.

MR. J. A. LEES.

British Journal Dental Science, May.

The first thing in treatment, and on this I lay great stress, is to remove the loose clot already present, and thoroughly wash out the tooth socket with hot water. By so doing the hemorrhage may be checked temporarily, and the introduction of a medicated plug rendered easier. It is no less unsurgical than foolish to dab tannin or turpentine about the part without attempting to get down to the bleeding point. In many cases it will be found quite sufficient to plug the cavity carefully with iodoform gauze. Take a long, narrow strip somewhat pointed at one extremity, introduce this pointed end first, and fold the gauze over upon itself till the socket is filled, keeping the plug firm and solid and close to the walls of the alveolus. Or cotton dipped in mastic, and well rolled in tannin, may be employed and makes a most excellent plug, small rolls being passed down first, according to the number of roots of the extracted tooth. Another good method is to dip a small pledget of cotton in oil of turpentine or perchloride of iron; pass this right down to the bottom of the socket, then methodically fill up with strips of lint. Cork and wax plugs are often used, but I prefer such a substance as lint or gauze; it can be kept better to the walls of the tooth socket, and the nature of the material greatly assists blood coagulation. The best plug, as before said, is the extracted tooth with a few shreds of cotton soaked in turpentine placed around the apex of the root; the tooth, however, is not always to hand. Whichever method of plugging be employed, it is of great importance to keep

up pressure on that plug within the mouth; sometimes a figure eight ligature around the two teeth on either side of the socket may be applied, or lint may be, as it were, built up on the top of that in the socket kept in position by firm closure of the jaws, or a plate of shellac or composition may be molded over the jaws. The particular method employed is of little importance provided the object is gained, firm and constant pressure. A bandage under the chin is a useful accessory, rendering the pressure very efficient, and at the same time affording relief to the muscles. In severe cases it is better to employ it than depend on the volition of the patient.

When the hemorrhage is indicative of some constitutional vice, internal remedies should not be neglected. Gallic acid, ergot or oil of turpentine may be given, and are the most successful remedies in recorded cases. The two following prescriptions are given by Salter:

℞ Vitelli ov. ij.
Olei terebinth ℥ jss.
Sacchari ℥ ij.
Tinct. ferri ses chloride ℥ iij.
Aquæ ℥ viij.
M. A teaspoonful to be taken every hour.

℞ Acidi tannici gr. v.
Spt. vini rect. ℥ ss.
Aquæ ℥ iss.
To be taken every hour.

Other circumstances should be attended to. The patient should occupy a cool apartment, and keep the upright posture; if he goes to bed his head should be elevated as far as possible. In women, when the hemorrhage is associated with suppressed menstruation, the treatment should be directed to the cause.

## FERRIC ALUM STYPTIC.

The best styptic, from its non-irritating properties, according to Professor Cheever, of Harvard University, is ferric alum. It coagulates the blood very quickly, but forms with the clot a sort of sand, which is not very irritating to the tissues. Referring to its

advantages over persulphate or perchloride of iron, he remarks that ferric alum forms a smooth sort of tissue, while the two former agents form hard, brittle, angular masses.

## HEMORRHAGE AFTER EXTRACTION.

DR. T. C. GLEDHILL, PHILADELPHIA.

To control undue hemorrhage after extraction, apply, to the alveolus, until full, pledgets of cotton thoroughly saturated with phenol sodique dipped in tannic acid. Hold finger on last piece one or two minutes to compress it.

## DENTAL HEMORRHAGE.

Hot water injected slowly and carefully into the socket will often arrest the bleeding.

## CHRONIC NERVOUS HEADACHE.

℞ Celerina.....6 ounces.
Tinct. hyosciamus.....1 ounce.
Tinct. gelsemium.....1 ounce.
M. Sig.—One teaspoonful taken before going to bed.

## HEADACHE POWDER.

Dental Review, June.

Caffeine citrate } āā 40 grains.
Sodii bicarb. }
Lactopeptine.....grs. xv.
M. ft. pulv. No. xx.
Sig.—One every two hours until relieved.

## NERVE FIBER.

DR. BOGUE, NEW YORK.

International Dental Journal, July.

Put arsenic, morphine and cinnamon together, and chop up finely a quantity of cotton, mix the medicament with it, and fill a bottle with the combination. It is ready for use whenever required, and is very comforting and quieting if the pulp is in a state of irritation. This preparation will not ooze out on the gum.

## RIGGS DISEASE.

Southern Dental Journal, July.

Dr. B. F. Arrington in writing on this disease says smooth edge instruments should be used only, in removing deposits on the roots. He argues against sharp or knife edge instruments. He says after the removal of deposits brush the teeth thoroughly with a small toothbrush, using diluted sulphuric acid and pumice stone, seldom using the acid stronger than one part to five of water, nor weaker than one to thirty. Be careful to see that the acid enters the pockets. Urgently request the patient to use friction on gums with finger after using brush. The mouth must not be rinsed immediately after using the acid. After it is rinsed, he uses campho-phenique. Speedy cures are reported by this treatment. From the toothbrush used in treating he cuts out every other row of bristles.

## RIGGS DISEASE; TREATMENT.

DR. J. E. CRAVENS, INDIANAPOLIS, IND.

Dental Cosmos, September.

The surgical work must be done thoroughly. If you do not remove all of the calcareous deposit from the root of the tooth, either in pockets or scattered, the case will not get well. If you get all of that out and then follow the treatment I indicate, you will have resolution in every case.

The first step is to scrape the root of the tooth; do that after

anesthetizing locally, so that it is possible to scrape the root painlessly; then wash out the pockets with the hot water to get rid of everything that is loose in it. Then apply dilute sulphuric acid, one part of the sulphuric acid to ten parts of water, using the common commercial acid. Apply it in two ways, with a syringe or a common quill toothpick, a very useful thing where you wish to use sulphuric acid or nitrate of silver. It is very flexible, and is not affected by any of the acids you use. Fill the pocket with this sulphuric acid, that is all; if it escapes in the mouth it will do no harm beyond perhaps etching the teeth a little bit.

That is the end of the first sitting. The sulphuric acid will occasion pain in applying in that way, but if the operation of scraping has not been very long, you will find that the effect of the cocaine will hold over, so that the sulphuric acid will not occasion any pain.

The second sitting is not a surgical one; the first one should complete the surgical part. Begin with the hot water, and thoroughly wash the pockets as many as four or five times with an ordnary plunger syringe, forcing it in with strong pressure; then follow with a ten per cent. solution of nitrate of silver. That solution is not caustic, because you cannot get the pockets totally dry. Leave some of the water there so that the silver solution in it is instantly diluted. Use just enough to fill the pockets, because if you have an excess, and there are any gold fillings in the mouth, it will discolor them, or if you use a great deal you might very seriously injure the surface of the teeth. One application of the nitrate of silver ought to be sufficient. Then discharge the patient without any further treatment at that sitting. For the third usually allow four days between each sitting, though the period might be increased to six. Wash out with hot water and for the nitrate of silver substitute bromo-chloralum, which can be purchased at any drug store. It is a powerful astringent. Use it full strength and in the same way, either with a syringe or with a quill.

There should be but three sittings. If there is pus evident at the third sitting, scrape the tooth again, have the patient come once or twice every one, two or three weeks, to have the pockets washed out with hot water and give them a douche of the bromo-chloralum that is diluted perhaps one to five or six, and take occasion to examine the case to see if it is all right.

# RIGGS DISEASE.

DR. H. A. KELLEY, PORTLAND, ME.

International Dental Journal, February.

When you find a bright red line at the border-line of the gum, there is the beginning. It has nothing to do with tartar. It may come from constitutional disturbances; it may originate from some form of nephritis, or a long siege of sickness. Immediately succeeding we have a development of micro-organic life. This disease has its origin in inflammation of the periosteum or pericementum of the roots of the teeth. There is no question about that. It naturally follows if we are to treat the teeth properly we must direct our attention to the micro-organic life first, and not to the tartar, which is secondary. Where tartar is, in my judgment, there cannot arise—does not arise—this pathological condition. No man has ever been able to tell the cause of the disease; there is a catarrhal process, but what causes that to be set up has not as yet been solved. The deposits on the roots is a result of this catarrhal process. First, there is irritation, then follows micro-organisms, and these, in turn, become a source of irritation; but their direct connection with the disease has not been determined.

In the condition called phagedenic pericementitis the first thing is to remove any deposits that may be present as complications. After this is thoroughly accomplished it is absolutely necessary to resort to medicinal treatment. There is in well-developed cases no chance of nature effecting a cure even with the calculus entirely removed, for the exciting cause still remains. The pericementum is being disintegrated and the alveolar wall absorbed. We must remove the diseased parts with instruments. Then the lacerated pockets should be washed out to remove the débris and blood-clots. For this use a solution of mercuric chloride in peroxide of hydrogen, one grain to the ounce. If there is great congestion of the gum, apply a thirty per cent. solution of chloride of zinc deep down into the pockets. Then proceed with Dr. Black's one, two, three solution.

Oil of cinnamon ..... 1
Carbolic acid, cryst ..... 2
Oil of gaultheria ..... 3

Inject this into the pockets, once in four days, full strength, and supply the patient with the same solution diluted to one-half its strength with oil of lemon or oil of anise—I prefer the former—to be used as a mouth-wash. The patient must be watched carefully, and great care must be taken to prevent a return of the irritation of the gum margin, and cleanliness must be insisted upon, with examinations continued indefinitely, for I do not believe a cure could be absolutely promised with unfavorable conditions likely to recur.

## TREATMENT OF RIGGS DISEASE.

DR. JAMES TRUMAN, PHILADELPHIA.

International Dental Journal, July.

In compliance with a desire often expressed, the following method, adopted by the writer, is given in as brief a manner as possible. It has no claim to originality, except in the use of two agents, bicarbonate of soda and sulphate of quinine.

Abandoning all theories in regard to its etiology, the operator is asked to consider the state of the tooth and adjacent tissues. The tooth affected responds to a jar with a dull pain, indicating pericemental inflammation. The gum is loose and flabby. A probe indicates a pocket of varying depth. Calculi may possibly be found adherent to the cementum, not by any means a usual condition. Pus is manifested on pressure of the gum.

These being the representative diagnostic signs, the treatment resolves itself naturally into three distinct stages, which may arbitrarily be separated into primary, secondary and permanent.

The primary is to remove all sources of irritation. This is accomplished, first, by the use of antiseptics and escharotics. (*a*) Hydrogen peroxide, followed by (*b*) mercuric chloride solution (one to two thousand). (*c*) Saturation of the pocket with commercial sulphuric acid, twenty-five per cent. solution. This is applied with a stick sharpened to the form of a chisel, carrying the acid down on all sides. The aromatic sulphuric acid is not adapted to this, as it fails in strength and contains undesirable ingredients. This is followed in a few moments by (*d*) an antacid, bicarbonate of soda preferred; making this into a magma with water and packing it in

the pocket. The ebullition produced cleanses and also neutralizes all acid present.

The secondary is the filling of the pocket, on the conclusion of the primary treatment, with some agent which will prevent, for at least twenty-four hours, the development of pathogenic germs, and give time for natural processes in the formation of new tissue. This demands an antiseptic, readily formed into a paste and one not easily washed out. Very few agents are suitable for this. Aristol and quinine may be regarded as the best. The writer prefers the latter, for reasons not necessary to dilate upon here. The case is then left to be seen at a subsequent sitting—the second or third day.

Upon the return of the patient the pocket is washed out with warm water and examined. If calculi be present, they are to be removed. Further treatment with any form of escharotic is not advisable. The quinine should be renewed, and the patient given the following mouth-wash, with instructions not to omit it a single day:

℞ Hydronaphthol ....gr. xx.
Alcoholis,
Aquæ.....aa ℥ i.

M. Sig.—Half a teaspoonful of the above to a small tumblerful of water; to be used twice a day—morning and before retiring at night.

The case can then be examined from time to time, but the antiseptic wash must be continued indefinitely. Upon this will depend the success of the treatment. Any omission will be certain to cause a relapse, as it is rarely possible to close entirely the pockets, and, unless they are kept aseptic, inflammation will be renewed. This latter constitutes the permanent treatment.

The philosophy of the method thus briefly outlined is based on the fact that, let the origin of this pathological condition be what it may, whether, as some assert, by systematic disturbances or, as others affirm, by purely local irritation, the incipient stages are marked, first, by inflammation at the gingival border, followed by rapid development of micro-organisms. It is evident that these pathogenic germs must be removed before any further effort be made.

This accomplished, other conditions may be considered. Calculus, if present, will be found to be a secondary product adherent to the cementum, to be removed by sealers. This desposit holds, in the estimation of the writer, but a minor part in the irritation. The removal, combined with the antiseptic treatment, prepares the way for the use of a gentle escharotic. The object of this is to burn out any dead material present, giving the subjacent healthy tissues an opportunity to perform their normal function of restoration. This acid action should be only temporary, hence the use of an antacid to antagonize its possible destructive effects.

To accomplish a restoration of parts, protection from external influences must be secured. If this be not attended to, all the primary treatment becomes useless. This is at once the most difficult and uncertain, and, with ordinary remedies, generally results in failure. Hence the importance of employing an agent which will act as a protection to the pocket for at least twenty-four hours. It should be non-irritating and antiseptic, and be capable of being formed into a paste. This is found in the agent recommended—quinine.

The somewhat remarkable dual character of quinine—a protoplasmic poison and antiseptic—made its use as a topical application a natural sequence. It was applied by myself some years ago as an experiment upon a fungoid presentation, so common between teeth with cavities on their proximal surfaces. Freely scarifying the parts to permit absorption of the agent, it was found that rapid resorption of the hypertrophied gum took place. This was further tested on the various forms of gingivitis with equally favorable results. It was then used in pyorrhea alveolaris in the form of paste—sulphate of quinine and water—and with such satisfaction that it has become a standard therapeutic agent with myself in this disease.

The continued use subsequently of an antiseptic, in the form of a daily wash, is perhaps the most important of all, for, whatever treatment be used, if the patient fail to continue this, there will be a return of all the original symptoms. This will be understood when it is considered that the pocket rarely closes entirely, and any depression remaining invites to collection of the fluid contents of the mouth and subsequent fermentation.

The use of hydronaphthol is not only of great value in this

lesion of the pericementum, but is also in all forms of gingivitis, and should be recommended for daily use in keeping rubber-plates free from irritating accretions. Where this or similar powerful antiseptics are used, of a non-toxic character, the inflammation of the mucous membrane, so commonly connected with the wearing of these plates, will, in most cases, be prevented. The plate should be kept at night in the solution, weakened by water. Thymol and creolin may be substituted for this; but, in the experience of the writer, this agent has proved effectual in all forms of oral inflammation, and in the amount named is non-irritating and free from any injurious effects.

## SOME THOUGHTS UPON RIGGS DISEASE.

DR. W. C. BARRETT, BUFFALO, N. Y.

Dental Practitioner and Advertiser, July.

Within the realms of dental pathology I know of no single subject that demands so much of scientific and intelligent observation as that condition which we call pyorrhea. The etiological problem which has vexed dentistry ever since it had an organized existence—that of the origin and cause of dental caries—has been practically solved. But concerning the next most common and destructive disease of the teeth, there is no intelligent and consistent theory that is accepted by any considerable proportion of dental pathologists. Those who do essay its cure are at work in the dark, and the remedies used are altogether empirical, while the great body of dentists do not attempt any radical remedial measures whatever, but assure patients that the disease is incurable, and stand idly by and philosophically witness the destruction of the organs which it is their accepted duty to save.

This condition of affairs is not at all creditable to us. We sometimes reproach medicine that it has not yet learned the pathology of many diseased general conditions, but here is our second greatest enemy stalking the field in contempt of our efforts, clothed in a coat of mail that has so far proved impenetrable to our most polished weapons. It is time that we became awake to the situation, and set about the study of it with some degree of persistent and intelligent earnestness.

The term pyorrhea alveolaris means simply a flow of pus from the alveolus, and would thus include all septic conditions of that process. But by common consent the meaning is limited to a discharge of septic matter about the gingival margins, though the actual source of the pus may be deep within the tooth-socket. Miller says there are without doubt three factors active in producing this disease—a constitutional taint, a local irritant and micro-organisms. This is undoubtedly true, yet to my apprehension they are not all equally active in different conditions, nor are all of them necessarily factors in every case of that which is usually called pyorrhea.

I think I can recognize at least three different phases of the disease, each perhaps having its own special etiology and distinctive symptoms, and each demanding treatment peculiar to itself. I will endeavor as briefly as possible to sketch the probable etiology, the symptomatology, the pathological changes as I have observed them, the prognosis and the course of treatment that I have adopted with the best of success in each case.

### GINGIVAL PYORRHEA.

The characteristic appearance of the first condition which I will consider, consists mainly of an inflammation of the margins of the gums, or gingivitis, distinguished by the presence of pus and the breaking down of tissue, caused by a purely local irritant. It commences with a kind of stomatitis of a follicular character, and localized at the gum margins. This is not always the result of a lack of proper care of the teeth, but it may be a local manifestation of a general atony. The mucous follicles, which are numerous and somewhat specialized at the gum margins, show degeneration in their function, and the condition of the secretion is materially changed, becoming irritating in its nature, and perhaps even excoriating. The gums are swollen and spongy, and are characterized in extreme cases by a kind of purple color, almost akin to that of necrosis. They are exceedingly turgid, but retain their glistening appeareance. They are somewhat everted, and the edges, instead of the sharply defined margins against the tooth, are rounded and thick. The inflammation, having its origin in the gum tissue, proceeds to the pericementum, and there is a wasting of that, nearly evenly about the tooth, with the consequent absorption of the

edges of the alveolar walls. There is an effusion of plastic lymph at the point of inflammation of the pericementum, and this is broken down by the continued irritation and the septic condition which follows, and the result is an almost constant discharge of pus.

Yet I consider this flow, as well as the destruction of the pericementum and alveolus, but secondary, and consequent upon the train of symptoms first described. There is little if any, deposit about the necks of the teeth, and if it be present it is not a primary etiological factor, since the condition may exist and the teeth be entirely clear of any deposit whatever.

The etiology, while it may rest in a general atony, is not cachectic, but rather accidental. It begins with the follicular stomatitis to which I have referred, and which produces an altered condition of the follicles and of their secretion, and this of itself becomes the local irritant which intensifies the state.

The pathology consists in the morbid change in the follicles, and the hyperæmic condition of the gums, with a great degree of œdema, or infiltration of the soft tissues, a pouring out of plastic exudate and its infection and breaking down, all these in turn, by contiguity of tissue and by local irritation, producing an inflammation of the pericemental membrane, with ostitis and wasting of the edges of the alveolar walls. It is this condition which is so frequently mistaken for a worse one, and in my opinion this is the class of disturbances, marvelous cures of which are so often related in journals and at dental meetings, as the result of a few days of empirical medicament.

The treatment is simple and the prognosis always good. If there be a reduced tone of the system, tonics should be employed with plenty of out-of-door exercise. The food should be generous, and every hygienic precaution should be used. Massage of the gums with the ball of the fingers, and the frequent use of a rather soft brush should be resorted to. Some form of mild cauterant may be applied at the margin of the gums, and ropes of cotton wet in it should be pressed down beneath them to the edge of the alveolus. I have found aromatic sulphuric acid extremely useful in such cases, but a dilute solution of silver nitrate, carbolic acid, or of the so-called Robinson remedy (carbolate of caustic potassa) or of trichloracetic acid, are useful. Caustic pyrozone, a remedy that has lately come into use, is excellent, and I have had remarka-

ble results from it in such instances. Some antiseptic mouth-wash should be employed, and for this purpose I have found nothing better than listerine, which may be used in full strength upon the brush, or diluted with five to ten parts of water as a mouth-wash or gargle.

Some stimulating astringent may be employed as an occasional dressing, and for this I have found a solution of chloride of zinc, five to ten grains to the ounce, excellent. Of course general remedies are indicated if the condition be only a local manifestation of a general anæmia and malaise.

### NODULAR PYORRHEA.

The second condition which I wish to describe, is marked by another train of symptoms, and its pathology varies from the first. The initial manifestation, so far as I am aware, consists in the deposit upon the periphery of the root, at some point, of a hard, dark, closely adherent nodule of calcific matter. This may increase until the whole side of a tooth may become involved. As it characterizes the condition, it may be well to consider this deposit more particularly.

It differs from the usual calculus found upon exposed portions of a tooth or dental plate, not only in color and density, and general appearance, but in locality. The usual tartar is from the saliva, and is precipitated, as is the lime which forms the coating on the inside of teakettles and boilers. The calcium is held in solution in the saliva by an acid, which in a healthy, normal condition, it nearly neutralizes. Coming in contact with the carbon dioxide of the breath, a carbonate is formed which is precipitated.

But the chemical formula of the deposit which causes or accompanies the condition that I am now describing, is different. I have not at hand any exact analysis of these deposits, but I believe it to be the fact that there is a larger percentage of phosphate, and a smaller of carbonate of calcium, than in ordinary deposits. Its origin is not from the saliva, and hence it cannot be called salivary calculus. Undoubtedly it must be derived in some way from the blood, and hence it has, by Dr. Ingersoll, been named sanguinary, and by Dr. Black, seruminal calculus. Either name is quite correct. Black, in his paper in the first volume of the American System of Dentistry, says that he believes the deposit to be the result of any

irritation of the gingivæ which will cause them to weep a serous fluid. I cannot but question this statement, because of the fact that it is not infrequently found near the apex of the root, even when there has been no apparent great pericementitis. It is sometimes entirely isolated from the gingivæ, and small nodules may be found upon teeth in which the gingival border of the alveolus is complete, with no opening to them from the cervical margins. This leads me to the conclusion that the deposit of these nodules is the initial lesion, so far as the tooth and its investing tissues go.

My own impression is that it is due to some special stimulation of the pericemental membrane, and that it is analogous in its origin to that condition called excementosis, or hypercementosis, except that the deposit from the membrane is not in any sense organized, nor indeed is it the result of anything like true functional activity. But be that as it may, the deposit is peculiarly irritating in its nature, and when the accretion is sufficient in volume it induces a breaking down of tissue, a resorption of the alveolar walls, with a destruction of the pericementum until the cervical margin is reached, and thus a pocket is formed extending from the gingivæ to the extreme limit of the deposit.

The etiology, then, of this form of pyorrhea, I believe to be in an abnormal condition, whether general or local, of the pericementum of a tooth, that induces the lodgment upon the root of a peculiarly irritating deposit, the sanguinary or seruminal calculus, and the mere local irritation of this produces the subsequent changes.

The symptoms are, first soreness and perhaps elongation of the tooth, which are usually attributed to other causes, until the pocket is fully formed by the destruction of the pericementum and alveolar walls. The pocket becoming septic, and the deposits constantly increasing, there is a discharge of pus from it, with inflammation and turgidity of the gum, and pain of a sub-acute character that is more or less constant. Occasionally there is an exacerbation of all the symptoms, with the characteristic indications of a pus gathering, which discharges and gives partial and temporary relief.

The pathology has already been briefly sketched. It consists in the breaking down of the tissues under the continued irritation of the deposits, with their constantly increased accumulation, and the spread of the diseased condition until the whole socket is de-

stroyed and the tooth falls out, when, the irritating cause being removed, there is a cessation of the degeneration.

The treatment consists in the removal of the calculi as a first step. This is usually quite difficult, from the close adherence of the deposits, and their density and hardness. If very much of the socket shall have been destroyed, so that the tooth is very loose, this will be found impossible, and the removal of the organ becomes a necessity. The operation demands delicate and peculiarly shaped instruments. Both the pushing and pulling movements will be found necessary. Sometimes a specially shaped cylindrical or pyramidal bur may be used to advantage. If the deposits can all be removed, there will probably be little difficulty in effecting a permanent cure. But to do this will entail the necessity for several visits on the part of the patient. After each operation the pockets should be carefully washed out, and they may be treated with aromatic sulphuric acid, this to be followed by a stimulating astringent. They should be douched with some antiseptic solution, such as mercuric chloride, permanganate of potassium, or antiseptic pyrozone, and should be carefully kept aseptic until the pocket has healed up with a deposit of new bone. If there is reason to suppose any real caries of the alveolus, the edges of the affected bone should be burred out to the limits of the deposit.

During the course of this treatment, if the teeth are loose in their sockets it is necessary to devise and insert some apparatus to hold them fast. It is folly to hope for any deposit of bone, and reproduction of pericementum, unless they are immovable, and much of the success of treatment will depend on this. I have usually been able to secure them by the use of ligatures crossed and woven between the teeth, and forming attachments to those which are sound. It is surprising what rigidity may be given to very loose teeth by a ligature ingeniously applied.

The prognosis depends upon the advance which the disease may have made before remedial measures were instituted.

### CACHECTIC PYORRHEA.

The third condition is the most serious of all. I believe the first of those described in this paper to be due to a local degeneration. The second to a local irritant, depending upon some general disturbance. Both are exacerbated by the presence of micro-organ-

isms. The third condition I believe to have its origin in some constitutional dyscrasia, for it can readily be traced from parent to child. There is little doubt that it is infectious, and it seems probable that there may be some specific organism to which it may be due. Possibly the belief that it depends upon heredity may in some instances have been obtained from the fact that the child is apt to become infected from the parent. It attacks people at an earlier age than either of the preceding conditions, and I have seen it with comparative frequency in children of ten or twelve years. The initial point is in the peridental membrane. There is, as the primary lesion, an inflammation of the pericementum, producing an elongation and soreness of the tooth, and that, too, without any immediate threatening of loss of vitality. The other special symptoms, aside from the loosening of the tooth, are the characteristic red lines or blotches of the pericementitis, with an irritable condition of the gingivæ, and the discharge of pus from the sockets in the later stages. The pericementum dies in circumscribed locations, and the destruction of the alveolus follows through the consequent ostitis. Pockets may be formed about the tooth, but they will not be characteristic of the disease, as in the second condition described, nor will they be localized. The condition is not characterized by the formation of local deposits, as in the second condition, but the breaking down of the tissue is more general, and the flow of pus more profuse. The whole of the pericementum of a tooth may seem affected, and the disease spreads from one tooth to another, until perhaps before the first one is entirely lost, every one, in the upper jaw especially, may have been attacked.

In the second condition, other teeth will probably be affected by the same cause that produced the first lesion, but there is no contagion. Successive teeth become diseased precisely as in hypercementosis—through the general morbidity, and not because of any cachexia. But in this third condition, there is a distinct spread of the disease from one tooth to another in the same mouth. Furthermore, dentists may carry the infection from one mouth to another through unclean instruments.

To my apprehension there is a distinct element of heredity in this condition, for it can readily be traced through two or three generations. It might be urged that as it is admittedly infectious, there is a possibility that it may be communicated instead of inher-

ited, but there are many instances in which the parents have died sometime before the appearance of the condition in the children, thus precluding the possibility of direct infection. There seems to be a distinct diathesis connected with it. What this may be is not yet definitely determined.

The etiology, then, of this third state is probably constitutional, at least in the tendency to the affection. This may be aggravated by a lack of hygienic care, but even the most scrupulous attention to the teeth will not altogether prevent its recurrence. I have patients who are extremely fastidious in the care of their teeth, and in whose mouths I have determinedly fought the disease for years, only to see them return regularly with some new outbreak of it, when we had thought it entirely stamped out.

The pathological changes consist in a degeneration of the pericemental membrane, and its melting down and final entire destruction, with the consequent resorption and wasting of the alveolar walls of the socket of the tooth, the presence of micro-organisms and the evolution of pus. There is also another change that often accompanies this state, and that is a loss of position of the teeth. They became distorted, are inclined to separate from each other, and to fall outside the line of the arch. There is a spreading of the alveolus by what would appear to be an interstitial growth, until two teeth may be so far apart that it would be possible to insert another between them. Especially are the incisors liable to this irregular divergence, and I have seen many instances in which beautifully arranged natural dentures lost all their regularity, and were made to present a very unsightly appearance. The condition is never that of contraction of the arch, but seems to be a thrusting forward of certain of the teeth, causing a protrusion, or elongation, or a lateral divergence, sometimes to an extreme degree.

The symptomatology has already been sketched. It consists in a pericemental inflammation in the earlier stages, with all the usual indications of that condition, a distinct hyperæmia of the surrounding tissues, loosening of the teeth, a discharge of pus more or less constant, with soreness and pain of a sub-acute character. Not infrequently there is considerable of pyogenic fever attending the suppuration, with a general malaise.

The prognosis is extremely unfavorable. Local remedies may retard the progress of the disease and subdue the acute symptoms,

yet when relieved it is almost certain to return again sooner or later, and even to hold it in check will require the most unremitting attention on the part of both patient and dentist.

The treatment consists of the use of mild cauterants to destroy degenerated tissue, antiseptics to overcome the septic condition, with local stimulants to promote the formation of new tissue when practicable.

I have thus as briefly as possible sketched the separate forms of the exhibition of this disease. But I would not have it understood that they are always distinct and separate in their pathology, or even their etiology. On the contrary we frequently find the symptoms decidedly mixed, and the characteristics of the different states appearing in one individual case. Pockets may be formed, with deposits of seruminal calculi, and at the same time the divergence and sprawling of the teeth which marks the third condition. When such is the case, the leaning of the tooth is always away from the pocket.

I have in more than one such instance witnessed an open space extending nearly to the apex of the root, which inclined away from the bare membraneless walls, these being plainly seen to a considerable depth, there being no special tumefaction of the gum tissue to close up the space, and with but a limited amount of deposit, and in some instances without any signs of calculus whatever. Several such cases were presented at my clinics in the University of Buffalo during the past winter, and in at least two of them a free burring out of the affected alveolus to the bottom of the pocket, and its subsequent treatment with iodide and chloride of zinc, resulted in a new growth, entirely filling the vacancy, but without any effect in restoring the tooth to its original upright position. Whether there was a new formation of the pericementum may be an open question, but in one of the cases there was every appearance of it, and in the other it was not improbable. Of course I did not dare to attempt the moving of the tooth back again by artificial means, being satisfied that this would eventuate in nothing but the breaking down of the newly formed osseous growth, and perhaps a worse state than that which originally existed.

# RECENT ADDITIONS TO THE THERAPEUTICS OF RIGGS DISEASE.

DR. A. W. HARLAN, CHICAGO, ILL.

Dental Review, June.

In considering some of the therapeutic measures to be utilized in the eradication of pyorrhea alveolaris or the correction of loosening of the teeth, the mind of the operator naturally concludes that the teeth have been firmly banded, wired or fixed in place, so that they will not be swaying to and fro like the branches of a tree in the face of the wind. A presupposition will also include the detachment of sanguinary or seruminal deposits, their removal from the pockets, and the perfect cleansing of the pockets, with a solution of sodium fluosilicate in water, one to one hundred and fifty-five. This solution is in most cases followed by the injection of an eight per cent. solution of sozoiodol, which is dissolved in water. Now, if the operator desires to get the benefit of nascent iodine the injection of a very small quantity of pyrozone or hydrogen peroxide will liberate the iodine which will permeate the recesses of the pocket. It is not for a moment to be thought that the writer has abandoned peroxide of hydrogen, because it is used frequently for cleansing purposes, but some experiments with alkaline solutions, boro-glycerine in water, boric acid water, C. P., one to twenty-five, and sodium fluoride in water, one to three hundred down to one hundred and fifty-five, have convinced me that in the beginning of the treatment they are more valuable as cleansers than they have been thought to be. The products of the microbes in the pockets where pus is found are almost wholly acid in reaction, and an alkaline solution will be generally indicated instead of one acidulated. Later, in the management of such cases, stimulating, acidulated and astringent injections are a necessary adjunct in the control of the production of pus. We have been singularly fortunate in the last year or two in the general introduction of the trichloracetic acid, alumnol, and the combination of dilute sulphuric acid dissolved in cinnamon water. The various pyrozone solutions are the relatives of hydrogen peroxide, and as such are to be used in the places where peroxide of hydrogen was formerly indicated. The particularly valuable drug in the newest list is trichloracetic acid in varying solutions from one-half of one per cent. to six or eight per cent. in

water. This is a most valuable astringent, stimulant and refrigerant. Its germicidal value consists in the complete destruction of the organisms found in pyorrhea pockets. In a period of less than two minutes all movements will cease when one half per cent. solutions are used, and as even stronger solutions are required, we generally use double or quadruple this strength, it may be considered a positively effective germicide. The drug is used every other day or once in three days. When a powerful astringent is needed, one that will penetrate, an aqueous solution of alumnol is indicated. It has the property of coagulating, then dissolving the coagula and penetrating still deeper and reforming a coagulum, and at the same time it is a stimulant and germicide. It is soluble in water up to forty parts in one hundred. I generally use about two to seven per cent. solutions, seldom stronger, although experimentally I have used solutions up to the limit of solubility. In such cases—very desperate ones—one application will be found sufficient. Much discrimination is needed in the treatment of cases of loosening teeth, for instance in the general wasting of the alveolar process and recession of the gums without the sanguinary deposits on the roots. In such cases it is best to begin with from one to two per cent. of sulphuric acid dissolved in cinnamon water for four or five visits at intervals of three days between each visit. I recommend a dentifrice during this period composed of

℞ Sodium fluoride ..... gr. c.
Creta preparata ..... ʒ j.
Powd. orris root ..... ʒ ij.

Perfume with an essential oil to suit.

This treatment is followed, say, at the end of fifteen days, with injections of two to six per cent. of sozoiodol for a month, once every three or four days. When desired, a small quantity, one drop of the solution is injected into each pocket. If the gums are much thickened, with blunted septa, they are painted with a solution of iodide of zinc, twelve grains to the ounce of water, always carefully drying them before using the solution. When a case is presented in the acute stage, a paste composed of iodol and cinnamon oil is used, gently rubbing it into the pockets with a thin

spatula; when much pain is present, I use as an injection into each pocket the following:

℞ Melted carbolic acid.....minims xl.
Eugenol.....minims xxx.
Four per cent. solution of hydrochlorate of cocaine.....minims l.
Acidi boracici.....gr. lx.

At first the solution will not be clear, but after a time it will become homogeneous. One-half to one drop in a pocket will arrest the pain. Usually there are not more than three or four pockets to be treated under such circumstances, and there will be no particular soreness follow such an injection. This is not to be repeated unless there is great pain.

In rheumatic subjects, I have found from five to ten grains of iodide of potassium in peppermint water, after meals for a week or two, will materially aid the local measures. All cases of loosening where there are seruminal deposits, are much benefited by using trichloracetic acid in water up to six or seven per cent. injected into the pockets carefully with a gold, glass or platinum pointed syringe. An interval of one or two weeks is allowed to elapse from time to time in the treatment of all cases, without any care save cleanliness and massage of the gums by the patient himself. This will be found of decided utility when the tissues become, so to speak, habituated to the introduction of medicines. I need not emphasize the uselessness of attempting to save all loosened teeth, as there are some from their location and the occlusion that no treatment will save permanently. This matter of extraction must be decided by the dentist without delay, as the attempt to save a tooth already hopeless is only a waste of time, and it may endanger the future stability of others not much affected. The destruction of a pulp of a tooth is often indicated when it is inflamed from the depth of a pocket, alongside the root of a tooth. Many cases that are so stubborn that they will not yield to local treatment are promptly relieved by the filling of a root and the continuance of the previous line of medication. I do not urge the unnecessary destruction of the pulp of any oral tooth, so it will cause disfigurement, but great care must be exercised in the selection of cases, with the happiest results, should no mistake be made in the outset.

If the patient in any case is found to be a mouth-breather, a rhinologist should be selected to correct this habit if it is possible to do it. Enlarged tonsils and a thickened nasal mucous membrane must be gotten rid of in some manner before the protrusion of the teeth can be arrested. Probably the greatest number of deformities in the protrusion of the six anterior upper teeth are produced by mouth-breathing, aside from the loss of the inferior molars, allowing the inferior incisors to strike against their lingual surfaces. This latter case being purely mechanical, the fitting of teeth or bridges to supply the loss of molars is indicated as a means whereby the protrusion can be arrrested. The whole modus operandi of treatment of loose teeth requires much patient study and the adaptation of every aid to secure any degrees of success, therefore I urge upon you the absolute necessity of studying each case before laying out a line of treatment, as no well-defined plans in advance will cause much subsequent trouble and the probable loss of many teeth which might be saved had thought been bestowed upon the case in the beginning.

## PYROZONE; ITS USES.

DR. C. B. ATKINSON, NEW YORK.

Dental Cosmos, April.

Pyrozone, three per cent. aqueous solution of hydrogen dioxide, may be used freely as a mouth wash by both children and adults; also it is a valuable adjunct in caring for a frequent condition in children's mouths, where, from malnutrition during gestation and the sundry eczemas of childhood, the teeth become pitted or wasted of the enamel, by which cavities are exposed to the destructive influence of caries. The three per cent. both bleaches teeth in this condition, and retards the progress of destruction.

As a mouth wash for use of habitual smokers the three per cent. is effective in removing the oily deposit so offensive to sight and dangerous as an absorbent coating into which are deposited fluid food products, possible of fermentation, from which caries may result. As a wash and injection into large abscess-pockets, this three per cent. proves an excellent cleanser, and in many instances becomes all-sufficient as a means of cure.

The five per cent. pyrozone, ethereal solution is a bleacher of teeth, entirely harmless both to the tooth structure and myxomatous tissues. Its use on ulcerating surfaces secures a rapid reduction of the suppuration, and without a resulting coagulum. A special pyrozone atomizer has been devised which permits of a wide range of use for the ethereal solutions, and in aphthous patches, chronic congested fauces and furred tongue, with their kindred conditions, a very much improved method of treatment is thus secured.

Twenty-five per cent. pyrozone, ethereal solution, is probably the best bleacher for teeth that has ever been offered. Its effect is exceedingly prompt and the results are permanent. The process is not attended with pain unless the gums be touched, when a severe pricking sensation is produced, and a coagulum seems to form in most cases; but this will return to a normal condition if not abraded. In the deep pockets of pyorrhea alveolaris a small tent wet with this twenty-five per cent. will be found sufficient in most cases to terminate the suppuration, and in other abscess pockets, as those of the alveolus and in the treatment of putrescent root canals, the concentration of the twenty-five per cent. pyrozone enables a minute quantity to be placed in situ with comfort to the patient and an effective result for the operator. One result of the action of pyrozone, as of other preparations of hydrogen dioxide, deserves attention in its connection with discriminative diagnosis. When brought into contact with venous blood, a free, somewhat discolored froth appears, which may readily be supposed to indicate pus. If this be true in every instance, it would be evidence of a circulation of leucocytes, and indicate a systemic debility only awaiting local irritation to be called into activity. This action, taken with the increased activity at congested points when pyrozone is topically applied to a suspected site of the disease, adds a valuable corroborative diagnostic aid to the many uses of these oxygen conveyors, whose field expands constantly as familiarity with them increases. Another point for differentiation occurs in the action of pyrozone upon organic accumulation in the mouth and about the teeth. Froth does not necessarily indicate pus, but may simply be the activity of oxidation of organic accumulation.

A first use of pyrozone, three per cent., except the presence of pus is otherwise evident (demonstrable upon pressure if concealed within a pocket, or by palpation if in an abscess, or by sight if ex-

uding) is to cleanse the territory by bathing or rinsing, followed by removal of all froth which appears. Then the pyrozone, three, five or twenty-five per cent., may be used as an indicator of pus, as the surfaces will be clean and its action unobscured by surface accumulation.

In lacerated and incised wounds, recent and chronic abscesses, deep and superficial, ulceration of the myxomatous tissue and of the epidermis, and on normal tissue, the twenty-five per cent. pyrozone has been exhaustively tested during the past ten months to determine a caustic effect. In sixty-one cases embraced in the above category no single instance of coagulation has occurred. The white apparent coagulum appears immediately with very considerable pain, which latter is much less on mucous membrane than on the skin, and subsides more rapidly, ease succeeding in five minutes on mucous membrane. On the skin the pain subsides in seven minutes, followed by a throbbing sensation for about three minutes longer, when ease is secured. In from ten to fifteen minutes the normal tint returns on the mucous membrane. In about thirteen minutes the beginning of return to normal tone of color will be noticed on the skin, which progresses with increasing rapidity for one hour and a quarter to one hour and a half, when the bleaching effect passes off. A circumscribing territory of congestion accompanies the application of the twenty-five per cent. pyrozone to the skin, which persists as a red spot, gradually narrowing its limits for a period of two to three hours after the application, varying with the susceptibility of the skin. The persistence of the bleach for an hour and a half is considered excessive, the normal tint being usually recovered in less than one hour. The apparent coagulum is believed to be due to the extreme activity of the liberation of the oxygen, which element, combining with the effete accumulation in the venous blood column, adds the specific bleach of the oxygen to the compression due to the activity of the dismemberment of the pyrozone molecule driving the blood back, and upon the return of balance of pressure in the local circulation the normal color is re-established, no permanent change of normal tissue occurring. Herein lies the perfection of this seeker of the effete. It is death to extraneous organic matter, and life to healthy tissue, which it only temporarily irritates while engaging the enemy.

## COVERING FOR ARSENIC IN TOOTH.

After covering the arsenic with a concave dish of lead, lay on the cavity a piece of hard wax and melt it into the cavity by applying to it a hot instrument.

# ORAL SURGERY.

## DIAGNOSING ANTRUM BY ELECTRIC LIGHT.

Deutsche Monatsschrift für Zahnheilkunde.

Vohsen emphasizes the value of illuminating the antrum highmori in diagnosing diseases of it. He employs an apparatus, consisting of an electric lamp, a reflector and convex lens. The patient, in an absolutely dark room, takes the apparatus into the mouth, closing the lips over it. Under normal conditions the face then appears transparent, and a disease of the antrum may be readily recognized by a dark region in the corresponding side of the face.

## ANTRUM; TREATING.

DR. A. W. HARLAN, CHICAGO.

Dental Review, December.

Every new case of engorgement of the antrum presents some new features. Nearly all require to be opened so that there may be free exit for accumulations. When carious or necrosed bone is present and there is no immediate necessity for surgical removal of it, the complete saturation of it with a two or three per cent. solution of sulphuric acid in cinnamon water is all that is needed to separate the dead from the living bone. I generally begin the irrigation of an antrum with salt water, one to twenty, at 100° F. After two or three days, according to indications, dilute zinc sulphate, one-half to two per cent. in water, alternating with boroglycerine, three to five per cent., in water, always tepid, sometimes following with the latter, after the use of the astringent. Do not irritate by using too much force in irrigating the antrum. Avoid too concentrated solutions; better use more of the solution than to cause smarting, burning or excoriation. Wash the antrum daily at first, at the same hour of the day, if possible. When a tube is used, do not let it get foul. The dry treatment of the antrum is

good when you are sure it is clean—not otherwise. A dentist will generally get better results from the "wet" than the "dry" treatment. When you are ready to pronounce the case cured, use soft water as the irrigant in making the final examinations. Have irrigation at first every other day; then once in three days; then in a week; then in two weeks, the last two washings being with salt water, or one-half per cent. boroglycerine water. In obstinate cases I have had good results, at times, with one-half per cent. solution phosphoric acid in water, as a stimulant and astringent, or even with nitrate of silver water, one-half of one per cent. Pyrozone—yes, certainly—cleanser only; not as an irrigator for the antrum. Clean the tubes with it—the syringe—anything; but inject? No!

## ANTRUM.

Dental Register, March.

In speaking of diseases of the antrum following the "grippe," Dr. John S. Marshall reported several cases. In opening into this cavity, he prefers to enter between the roots of the first and second molars, as he says that is the most dependent portion. In treating such affections of the cavity, he likes Thiersch's solution:

| | |
|---|---|
| Boracic acid | 12 parts. |
| Salicylic acid | 4 parts. |
| Water | 1000 parts. |

## GUTTA-PERCHA SPLINT FOR REPLACED TEETH.

DR. W. H. TRUEMAN, PHILADELPHIA.

Dental Office and Laboratory, July.

After the teeth were inserted the gutta-percha was softened and a strip laid over their labial faces, the teeth being supported by the finger on their palatal surfaces. When this hardened a similar strip was laid over the palatal surfaces. Holes were made through these plates with a hot instrument and the two plates united by ligatures passed through these holes at the necks of the

teeth and tied with the knot suggested by the late Professor Barker. This being done, the gutta-percha was wiped dry and coated with a film of the oil of cajuput, when another strip was softened and laid over the knots. This presented a smooth surface to the lips, which would have been irritated by the knots. The splint worked very nicely and was worn with little discomfort by the patient, and the replaced teeth were held securely in place until a perfect union was established.

## REDUCING DISLOCATION OF LOWER JAW.

MR. FELIX ROTH.

The Lancet.

The patient is seated in an ordinary cane-bottomed chair; the operator stands before him with one foot placed slightly to the right side and the other just in front of the patient and in the middle line. The operator is thus on a firm basis, with the legs well apart and fully extended. He then flexes himself at the hips and asks the patient to lean forward and to place his forehead in the middle of the sternum of the operator's chest (but this position varies with the size of the patient's head). The operator now flexes his head so that his chin grips the patient's head about the upper part of the occipital bone; he thus acquires a firm hold and has the head well under control between his chin and chest. The thumbs, protected in the usual manner, are placed in the patient's mouth and the fingers of both hands grasp the lower jaw. In this position reduction is facilitated.

## COMPOUND FRACTURE OF THE INFERIOR MAXILLA TREATED BY WIRE SUTURE.

DR. T. S. CARTER.

The Lancet.

The great advantages over other methods are the perfect rigidity of fractured portions, neatness, cleanliness, absence of a bulky splint and an earlier use of the maxillæ for masticating purposes.

A powerful ferryman, aged nineteen, was admitted into the Leeds General Infirmary on May 11th, suffering from compound fracture of the lower jaw, etc. A gutta-percha splint and a four-tailed bandage were applied, but without effect. The lower mixilla was fractured transversely across the ramus on the patient's left side, also, perpendicularly between the two fangs of the first molar on the same side and likewise perpendicularly through the socket of the second bicuspid on the patient's right. The front portion was much displaced, being deeply depressed, exposing the second fang of the molar in its full length. The front portion was also considerably overlapping the posterior part, carrying the median line of the maxilla considerably over to the patient's left side. Impressions in wax were taken of both maxillæ. On May 20th the patient was anesthetized, and, with a dental engine and specially made bayonet-shaped drill, a hole was made through the jaw between the first and second molars on the patient's left side, an oral spoon on the inner side guarding the drill from piercing the root of the tongue. A stout silver wire was passed through the drill hole and a second hole between the fang of the canine and the first bicuspid, and the ends were twisted together and tightened with pliers. The chief difficulty in these cases is to return the wire after having passed it through the first drill hole.

The method adopted is as follows: While drilling the hole get an assistant to hold an oral spoon on the inner side as a guard. Having pushed the wire through into the bowl of the spoon, the latter curls it from the tongue and one can then seize it with a pair of forceps. Then bend a long loop on it, and having passed a fine wire through the second drill hole, attach it to the loop and draw it through. The oral spoon is a great help by safeguarding the tongue, turning the wire, and preventing the finger from being lacerated in feeling for the wire—an important factor in cases of a specific character. In addition to the suture a Hammond's splint was applied, which fixed the fractured portion on the patient's right, and finally a well-ventilated gutta-percha splint.

On May 26th the parts were in a most satisfactory condition. There was no discharge and the patient was free from pain. On June 2d the portions wired together were in perfect position, but the back teeth met before the front ones, probably owing to the fracture through the ramus. A broad cotton bandage (double thickness)

was applied, the frontal portion being tightened in order to raise the body of the jaw. On the 11th the teeth were well opposed to each other. The patient was free from pain and all looked healthy. He was made an out-patient. On July 7th the bandage and Hammond's splint and wire suture were removed. All was found firm and in good position. In another case the inferior maxilla was divided in the median line to facilitate the removal of cancer from the floor of the mouth. There was difficulty in obtaining union in the ordinary way, but the application of a strong wire suture, applied as described, answered most efficiently and there was rapid union.

## TREATING FRACTURE OF THE JAWS.

DR. WM. CARR, NEW YORK.

International Dental Journal.

There is but little difficulty in establishing the correct diagnosis of fracture of the maxillæ, as the following symptoms are usually present: Severe pains in the effort to open or close the mouth, swelling, crepitus, inflammation, inability to masticate, and marked irregularity of the teeth, with more or less displacement.

Although there may be considerable displacement in fractures of the superior maxilla, yet, if properly treated, serious complications seldom arise, owing to the great vascularity of the parts.

The treatment is identical with that for other fractures—namely, to bring the parts into apposition and retain them firmly until ossification is complete. When the splint is properly adjusted, speedy union may be secured without deformity of the jaw or irregularity of the teeth.

In my own practice I have used the appliance known as Williams's Modified Interdental Splint, which is an improvement of the Gunning splint. The principal advantage of using this lies in the fact that the patient is enabled to continue his usual occupation without attracting special attention to his condition, as there are no external appliances connected with it. He cannot masticate, but receives nourishment in a liquid or semi-liquid form.

Before taking an impression a careful examination of the parts should be made by passing the finger along the margin of the jaw,

to ascertain whether any foreign substance or loose pieces of bone are present. No effort should be made to reduce the fracture before taking an impression, as this is practically useless, and inflicts unnecessary pain. Should there be loose or fractured teeth or diseased roots, they should be removed immediately, as their retention might possibly interfere with union. Also, all exposed pulps should be devitalized, as they might cause considerable suffering during treatment.

When the inferior maxilla only is fractured, an impression of the upper jaw should first be taken in order to secure the confidence of the patient; then take an impression of the lower jaw, using an ordinary lower impression cup, avoiding the use of too much compound, as only an impression of the teeth is required. For this purpose use No. 2 impression compound as warm as the patient can bear it, in order to prevent unnecessary pain; also to prevent further displacement of the parts, allow the compound to remain until hard; this will insure a sharp impression.

In making models, mix sulphate of soda or salt with the plaster to give solidity, saw the cast at the point of fracture, and articulate with the cast of the upper jaw; unite them with a few drops of melted wax and immerse the cast of the lower jaw in water, keeping it immersed until thoroughly saturated. Then reunite the two parts previously sawed by filling the space with thin plaster. When this has hardened, secure both casts in an articulator. Before waxing, trim the necks of the molars and bicuspids of both casts. This trimming is necessary to secure a tightly-fitting splint, as an impression rarely takes the undercuts of teeth. Separate the casts by means of a screw at the back of the articulator, leaving a space of about four lines between the incisors. This will leave sufficient room for the patient to receive nourishment. Place a strip of ordinary sheet wax over the teeth of the lower cast, extending it to the free margin of the gum. Also, wax in the same manner the teeth of the upper cast as far forward as the canines; next place a roll of soft wax on the grinding surface of the molars and bicuspids, and bring the articulator firmly together; remove the excess of wax and smoothe; then remove from the articulator, and proceed to invest as far as in an ordinary vulcanite case, taking extra precaution to thoroughly saturate the casts with water to prevent the formation of bubbles while flasking. After removing the wax,

paint the teeth with collodion or liquid silex, and cover with tin foil; then pack, having the rubber as soft as possible. Vulcanize for two hours, at a temperature ranging from 280° to 300°, in order to secure an elastic splint. Before adjustment, deepen the depression for the molars about one line; drill a small hole on the buccal surface of the splint over the grinding surface of each molar, for the purpose of ascertaining whether, after adjustment, the teeth are in proper position; adjust the splint to the upper jaw, and gently bring the lower jaw with the fractured portion or portions into position until it has passed about two-thirds the length of the teeth. Then with a quick, firm movement bring the parts into place; this movement will, necessarily, be very painful for the patient. After adjustment, pass the finger along the body of the lower jaw, to ascertain whether reduction is complete. Next apply the four-tailed or the straight bandage, which should be retained from three to five days, after which, in most cases, it may with safety be removed during the day, but it should be replaced at night until the splint is removed.

The patient should be instructed to keep the mouth thoroughly cleansed, rinsing it morning and evening, first with tepid water, afterwards with equal parts of tepid water and peroxide of hydrogen; at intervals during the day, listerine mixed with tepid water, in the proportion of one to three, should be used for the same purpose.

In ordinary cases the splint should be retained three or four weeks, according to the age and physical condition of the patient.

Unless unforeseen complications should arise, the application of the splint, combined with thorough cleanliness, will usually be all the treatment required.

## ARTIFICIAL DENTURES AS SPLINTS.

When a fracture occurs and the patient is wearing artificial dentures, they may be used as splints successfully. Remove the front teeth, place the plates in the mouth, articulate them and bind the jaws together. If necessary the two plates can be wired together.

# CASE OF FRACTURE AND SUPPURATION AROUND THE INCISIVE ALVEOLAR PORTION OF THE SUPERIOR MAXILLARY BONE, AND REIMPLANTATION IN THE SAME OF A LATERAL INCISOR EIGHT DAYS AFTER THE INJURY.

DR. A. C. HUGENSCHMIDT, PARIS, FRANCE.

International Dental Journal, November.

In October, 1890, one Saturday afternoon a gentleman came to my consultation to present his son, a boy ten years old, with the following history:

On the preceding Monday, that is, five full days before our examination, this young boy, riding a bicyclette at a great speed, was suddenly thrown to the ground, face forward. The road was wet and very muddy. The apparent result of the injury at the time was a vertical wound of the upper lip, complete fracture of the left central incisor, almost total fracture of the right central, while the left lateral incisor had been thrown out of the mouth into the mud on the road. The father, searching later on the spot of the accident, found the missing tooth, and after having wiped it placed it in his waistcoat pocket.

The lip was sutured by a surgeon of the neighborhood of the accident, who paid no attention to the buccal state of affairs, and the young fellow was left that way until we saw him five days later.

As soon as he entered the office, what struck one immediately was a most penetrating and sickening odor, which had for origin the buccal cavity of the boy. On lifting the upper lip, still greatly increased in volume on account of the sustained injury, a large quantity of pus exuded from the socket of the left lateral incisor, which was absent, as well as from the margin of the gum surrounding the roots of the central incisors. These roots could be moved to such an extent that they appeared as if they would drop out of the alveoli.

Probing with an exploring needle in the alveolus of the left lateral incisor, hard, irregular fragments of bone were encountered, and we found in addition a fracture of the anterior alveolar wall. Two vertical fissures existed, one started immediately above the

root of the right central incisor, while the other occupied the space between the alveolus of the left lateral incisor and canine of the same side. Moreover, to this fragment of bone was adherent, at its posterior surface, the root of the left central, the whole forming a unique mass quite detached from the body of the maxilla; from all these parts flowed extremely fetid pus. The first step in the treatment was to subject all these parts to a thorough disinfecting process with a solution of permanganate of potash, which was syringed through all the fissures which showed the least trace of pus, then boiled water was used to wash out the previous solution, and finally a series of injections of oxygenated water.

After having thoroughly disinfected all these parts, the young patient was sent away until the following Monday, recommending, however, to the father, that the boy should wash and bathe his mouth every half hour during the day, alternately with a solution of bichloride of mercury one to five thousand and a saturated solution of boracic acid. I directed the father to apply during the night, around all the teeth, and especially in the region which had sustained the traumatism, the following preparation:

Boracic acid ..... ℥ iss.
Vaseline ..... ℥ i.
M.

I must add that the father, before leaving me, had handed to me the lateral incisor, which he had kept in his waistcoat pocket ever since the accident. As I found on examining the tooth that no injury had been sustained by that organ, I determined to disinfect it as thoroughly as possible by opening the pulp chamber and by placing it in a solution of bichloride of mercury one to one thousand.

On the Monday morning eight days after the accident the young man was brought back to me; the prescription had been carefully followed, for I tried my best to find a drop of pus in the region which two days before was absolutely saturated by it. The parts looking so well, I determined to insert the lateral incisor.

To be on the safe side several injections of oxygenated water were made, followed by sterilized or boiled water; an injection of cocaine rendered the parts insensible. Finding the alveolus of the lateral obstructed by several spiculæ of bone, which had been de-

tached from its anterior wall, these were removed with the engine-bur, until the cavity was free.

The lateral was then removed from the bichloride solution, the pulp cavity dried and filled with gutta-percha, and finally inserted in the alveolus. It was maintained in place by means of silk ligatures around the left canine and what remained of the right central incisor. This last, which two days before was bathed in pus, had already become consolidated. Moreover, the ligatures were placed in such a manner as to maintain not only the reimplanted tooth in its place, but also the part of the alveolus which had been detached and fractured at the time of the fall.

The only treatment recommended during the consolidation process was buccal lotions with boric acid solutions in daytime, and boracic vaseline at night. Three weeks later the union was complete, the bone had united, and the tooth was firm in its place. The ligatures were removed. The tooth is in place to-day, two years after the accident.

The interesting part of this case is the extensive infection existing at the time the boy presented, and the insertion, only two days later, in that very time, of a dental organ, which did not produce the least inflammatory reaction or disturbance.

## SPONGE GRAFTING.

DR. GORDON WHITE, NASHVILLE, TENN.

In cases where it becomes necessary to amputate the root of a tooth for the cure of chronic alveolar abscess, I have found by experience that the operation is most satisfactory when the cavity in the bone, left by the removal of the root, is filled with a small piece of fine surgeon's sponge trimmed to approximately fill the cavity. The sponge is sterilized by steeping it in a solution of bichloride of mercury, two grains to the ounce for half an hour, at a temperature of 165° F. The sponge can be kept in the solution for future use.

The hands must be thoroughly washed in as hot water as can be borne and to which has been added a little carbolic acid. All instruments are thoroughly sterilized. This I do by washing in boiling water and, just before using, dipping in carbolic acid.

## SPLINT FOR LOWER JAW.

DR. ACKLAND.

British Medical Journal.

This new form of apparatus for fractures of the horizontal portion of the jaw, consists of a plated metal horseshoe-shaped piece which rests upon the teeth, and a similar one which is applied below the chin. These are fastened together by two movable clamps. The first is lined with ordinary splint gutta-percha, which is warmed and driven down on the teeth and gums. The chin plate, lined with two layers of wash-leather, is put into position and held there. The swivel clamps are then fitted on to both plates, and by a thumb-screw to each can be made to clamp both the plates together until the requisite tension is attained. It is claimed that this splint can easily be kept clean, that no bandages are required and that mouth washes can be applied over and over again in different cases without alteration or renewal.

## REPLANTING UNDEVELOPED TEETH.

DR. W. J. YOUNGER, SAN FRANCISCO.

Dental Cosmos, February.

Master Walter R., whilst running in play during the noon recess at school, fell, and striking a wooden peg in the ground, knocked out his two lower central incisors, making an ugly cut in his gum and shattering the outer wall of the alveolus, several fragments of which were broken off and exfoliated. The accident occurred at the noon recess of Wednesday, and the teeth were not found until four o'clock on the afternoon of the Friday following. On Saturday, the patient, with the teeth in his hand, was brought to me. I found that the roots had not yet completed their growth, the foramen being very wide and the walls quite delicate, but they were fairly covered with pericementum. I then placed the teeth in a solution of two and one-half per cent. of carbolic acid. On Sunday morning I prepared the teeth for replanting by removing the pulps, filling the canals with Hill's stopping, and finishing the apices with Slayton's gold and tin preparation. They were then placed in a one one-thousandth solution of the bichloride, whilst

the gum was being anesthetized with the cocaine preparation. The gums were still congested, and the portions of the socket left intact were filled up with new tissue. I therefore had to cut these granulations out and slightly deepen the sockets in the jaw itself. The teeth were then restored to the mouth, and kept in position by silk ligatures. I was somewhat anxious about the result of the operation for fear of the laterals, then only a quarter grown, pressing into the shoulders of the replanted teeth and lifting them out, or pressing them out of position in the process of their growth and development. I therefore relieved the lateral pressure by filing from the propinquitous surfaces of the deciduous cuspids, thus creating a space into which the laterals might press if crowded. The planted teeth became quite firm, and so translucent and natural in appearance that no one would suspect that they ever had been out of the mouth. The laterals, however, seem to be growing very slowly, especially the left one, and I suspect that the process of growth has been retarded by the shock of the accident and a possible lesion.

## BROPHY'S OPERATION FOR CLEFT PALATE.

DR. T. W. BROPHY, CHICAGO.

Dental Cosmos, September.

In looking over the history of staphylorrhaphy the reader will be struck with the likeness of complaints, the three principal of which seems to be the difficulty in tying the sutures, the great tendency of the sutures to slough out after they are once nicely secured, and the concealment of the parts during operation, both because of deficiency in light and the accumulation of the viscid muco-saliva which in mouths thus affected is secreted in such abundance.

In my judgment it is sometimes best to divide the operation into two stages, making the first operation on the hard palate, and subsequently, after the process of repair is complete, an operation on the soft palate. If, however, the operation is to be made on both the hard and soft palates at the same time—and this is sometimes admissible—the edge throughout the entire length of the fissure should be first prepared. The operations that have been

performed by Fergusson, Warren and others, on the hard palate have their advantages, and are commendable in cases of adults oftentimes, but in early infancy the new operation for the radical closure of the hard palate, as devised by me, will now be dealt with. The operation for the closure of cleft palate is one more or less dreaded by the general surgeon, both on account of tediousness and the not altogether satisfactory results. He then describes the operation as follows:

First, place the patient on the table, face toward the light, introduce the oral speculum, and vivify the fissure; do it thoroughly, and with a bold hand. A mere scraping of the mucous membrane will never suffice to bring about union which will be permanent and satisfactory. On the hard palate trim the opposing surfaces of the bone as well. This well done will secure sufficient exudate to make the operation a successful one, in this respect at least. The knife will easily cut through the soft bone of the hard palate and alveolar process of young patients. Then raise the cheek, and well back toward the posterior extremity of the hard palate, just back of the malar process, and high enough to escape all danger of not being above the palatal plate of the bone, insert a large braided silk suture, carrying it through the substance of the bone, so that it will come out at a corresponding position upon the opposite side. The silk suture is more easily introduced by the needle than the wire, but a wire or suture of silver should be substituted for it, and this wire may be doubled, in case the condition of the parts and the tension upon the tissues necessary to approximate them seem to require it. Nearer the front portion of the palate insert another wire, carrying it through the substance of the bone above the palatal plates and out through the bone in a position corresponding to the place of entrance. Then we have a wire passing over the palate in front of the malar process of the bone, and another behind.

The next step is to take a lead button, molded to fit the convexity of the part and long enough to pass beyond the exit of the wire sutures, so that the sutures will pass through it. Have it provided with eyeholes, through which are passed the protruding ends of the wires, and upon both sides twist the wires together, that is, the right side end of the anterior wire and the same on the left. It is better practice to always twist wires in one way, either

from right to left or from left to right. These sutures are heavy tension sutures, and, once approximated, the parts cannot be separated by the patient. If we are unable to close the fissure with these wires, if from lack of tissue or from firm resistance of the parts this cannot be done, there is a further method to be employed which will obviate these difficulties. With your knife, after the cheek is well raised, divide the mucous membrane just over the malar process. Here insert a knife in a horizontal direction, and when well inserted sweep the handle around from one side to the other, as from behind forward. In this way a maximum amount of bone is divided, and a minimum amount of mucous membrane. This done on each side, the bone can very readily be moved toward the middle line. Having thus divided the bones upon either side, the wire sutures passing through the lead buttons may again be twisted, and the cleft of the hard palate will be easily closed by approximation of the two sides. The incision in the mucous membrane in making the separation of the bones is as small as possible, for the reason that this membrane must serve to retain the bones in proximity or to hold them nearly together. If, after the parts are approximated, they are kept antiseptically clean, the bones will kindly unite, and the palate will be restored so that its full function will be performed. Separation of the bones is attended with little hemorrhage, and the parts do not usually cause more inconvenience to the patient than the ordinary operation of lifting the hard palate according to the practice of Fergusson.

The germs of the teeth are sometimes disturbed, as I have found later when they are erupted that certain teeth were imperfectly formed. This applies only to the molars of the temporary set, but it is not unlikely that the germs of the permanent teeth may also be disturbed, and the teeth made imperfect by this procedure. The palate, too, may be contracted to an abnormal extent, and yet it is a well-known fact that the alveolar processes develop with the eruption of the teeth, and my experience has convinced me that in mouths thus treated the teeth of the upper antagonize in a normal way with those of the lower jaw. If, however, the upper superior arch should be abnormally contracted, and when the teeth erupt fail to properly antagonize with their fellows of the lower jaw, the means well known to the modern dentist may be employed by which the arch can be expanded and the slight ab-

normality removed. After the approximation of the edges in the manner I have described, the parts should be thoroughly dried, edges of the wound carefully examined, and if need be some fine sutures inserted here and there to insure perfect coaptation of the parts. The after treatment is very simple, consisting solely in antiseptic cleanliness, nourishing the patient upon liquid food, the prevention of disturbance of the parts on part of the child, or the introduction into the mouth of anything that might interfere with the sutures. Abrasions of the mucous membrane caused by the buttons need not disturb the operator, for they are usually slight. So much for the operation for the radical closure of the hard palate.

The soft palate may be closed in the usual way, and it may be best accomplished by the use of a needle invented by Dr. Prince, of Jacksonville, Ill., with Dr. Black's "pick-up," which simplifies the operation and renders its performance easy. I regard silver sutures the best.

I desire particularly to enter protest against the division of the tensor-palati muscle, so frequently divided by surgeons with a view to relieving the tension upon the palate, and thus rendering its union more certain. This muscle once divided will never unite, as retraction of its fibers will occur instantly after its division, and we have consequently one of the most important factors in the anatomical structure of the palate destroyed. The tension upon the freshly approximated surfaces or edges of the wound of the palate may be relieved in another, and what I consider a far better way—better because the function of an important portion of the palate is by this means not destroyed. It consists in passing a wire through the borders of the tensor-palati muscle, as the muscle winds around the hamular process of the palatal bone, and fixing the loop with a large bead resting upon the visible surface of the hard palate, directly over the tensor-palati muscle. The wire passing through the bead and muscle is carried also to the opposite side, and thus pressure is brought to bear upon the fibers of this muscle, which will temporarily paralyze it, and thus remove the tension from the freshly approximated surfaces of the palate after the process of repair is complete; and this tension suture removed, the muscle will soon resume activity.

It must be remembered that a surgical operation to be a suc-

cess must leave the patient with sufficient palatal tissue to perfectly close the posterior naris during articulation. An operation may be surgically a success, but if there in not sufficient tissue to close the naris in the articulation of sound it will not be a physiological success. When there is insufficient tissue in young persons and adults to secure the closure of the posterior naris by operating, the correction of articulation is best accomplished by means of artificial vela; but whatever method of treatment of congenital cleft palate may be adopted improvement in the voice must be gained to a very great extent by education. The patient has in the first few years of life acquired imperfect habits of speaking, and particularly the guttural and nasal tone, which requires great care to overcome. It is essential that he should be taught to speak with his lips and to throw the voice forward. With proper teaching and diligent practice he will in time speak as distinctly as the majority of persons whose palates are normal.

[This operation was mentioned in the 1891 COMPENDIUM, but Dr. Brophy's continued success prompts its repetition in fuller detail.—ED. COMPENDIUM.]

## TREATMENT OF TIC DOULOUREUX, OR FACIAL NEURALGIA.

V. JARRE, M. D.

Facial neuralgia, known under the name of "tic douloureux," is the symptomatic expression of a lesion of the terminal nervous extremities, of a cicatricial nature. It is in the cicatrix of alveolar tissues, or deep alteration of tissues formed during the course of a chronic alveolar-dental periostitis or arthritis or strong infectious disturbance brought on by a vicious eruption of the wisdom tooth, that is seated the fundamental nervous lesion, the subjective symptom of which is a spasmodic neuralgia of the face.

The cicatricial region of the alveolus, which contains this lesion of the nervous extremities, is determined by the etiological antecedents as indicated above, and also by the point of departure of the painful phenomenon often indicated by the patient. Finally, in a certain number of cases, an exploration of the gums, seized between

the thumb and index finger, will bring on a painful sensation on a level with the suspected region. It is this region, comprising generally the extent of one alveolar opening, which must be well delimited, and if necessary, exposed by the extraction of one or two teeth, which limits the region on each side, before proceeding to its removal. This operation must be done as follows: it is divided in three steps:

First step.—Excision of the mucous membrane and periosteum covering the parts of the alveolar border to be removed: After having made a thorough antiseptic washing of the buccal cavity and anesthetized the region to be operated by means of an injection of a two per cent. hydrochlorate of cocaine solution, a deep longitudinal incision is made along the free alveolar border, extending to the length of two centimeters, and through the mucous membrane and periosteum. A second incision, penetrating also down to the bone, and parallel to the preceding, but only one centimeter long, is made on the buccal side of the alveolus, at about the level of the alveolar region which was occupied by the apex of the tooth when in position. Finally the two extremities of these two incisions are joined together by incisions obliquely directed from above downwards, that is from the crest of the alveolus to the incision on the outside of the alveolar wall, where these two incisions are made, the mucous membrane enclosed in the incision, has the form of a trapezium; this is removed with the corresponding part of the periosteum.

The same operation is now made on the opposite face of the alveolus, that is on the palatal or lingual side. An incision is made on a level with the apex of the alveolus on the lingual side and joined to an incision on the free alveolar border, another trapezium of mucous membrane and periosteum is removed, and we have now a denuded surface of bone starting from about the level of the apex of the alveolus on the lingual side, extending to a corresponding line on the buccal side. This limits the bone which is to be excised.

Second step.—Excision of the denuded part of the alveolar border: By means of a circular saw and the dental engine, two oblique sections of bone are made following the line indicated by the section of the soft tissues, and converging towards the apex of the alveolus, as it will be remembered that the incision opposite the apex, both on the lingual or palatal surface and on the buccal

side, is only one centimeter long, while the one on the free border is two centimeters. The section of bone is now only adherent to the maxillary by its summit, and must be removed with a cutting forceps.

Third step.—Scraping of the osseous wound: When all the osseous portion of the alveolar border has been removed, the osseous wound is scraped in such a manner as to remove all débris or irregularities which have been produced by sectioning with the cutting forceps. This part of the operation is carried on by means of a round bur and until the whole surface is even. The operation being finished, the wound is washed and dressed by means of antiseptic pellets of cotton introduced into the alveolus.

# MISCELLANEOUS.

## TO IMPROVE CANAL REAMERS.

Deutsche Monatsschrift für Zahnheilkunde.

Vajna recommends that flexible reamers for root-canals be made thinnest at a point about an inch from the end. If the instrument breaks at all, it will break at this point and the broken end will be sufficiently long to be removed by the pliers.

## ANNEALING BROACHES.

Zahntecnische Reform.

To prevent nerve broaches from burning up when heated red hot, encase them in a thin glass tube.

## TO MAKE TWIST DRILL.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Ohio Dental Journal, October.

Take a piece of fine piano wire, flatten by grinding or otherwise about half an inch at one end. Do this without drawing the temper. Twist the flattened end to the left, while held in the vise, with a pair of pliers. You will have as nice a twist drill as you can wish for entering the smallest canals. If carefully made they can scarcely be broken while in use, and can be made as fine and small as desired.

## STERILIZING INSTRUMENTS.

Oesterreichisch-Ungarische Vierteljahrsschrift für Zahnheilkunde.

Arkovy describes a new method of sterilizing dental instruments as follows: A glass vessel about sixteen centimeters long, ten wide and eleven deep, is filled with sterilized sand and enough of

the antiseptic (four per cent. solution of sublimate or concentrated lysol, etc.) added to thoroughly wet the sand. The instruments are drawn two or three times through the sand, or if strongly infected, are allowed to remain in a short time; after rinsing off in another vessel with the same antiseptic, the instruments are considered sterile.

## RENDERING GOLD CYLINDERS SOFT AND TOUGH.

International Dental Journal, August.

Dr. Niles, of Boston, says by exposing gold cylinders to the air for three weeks it renders them very soft and tough.

## GUTTA-PERCHA STOPPING.

DR. C. D. CHENEY.

Items of Interest, April.

Gutta-percha stopping, as prepared from the pure "chips" and oxide of zinc in the proportion of five of oxide to one of "chips," by weight, thoroughly incorporated at a temperature of 212 degrees, cannot be improved on. It is neither sticky, nor is it too hard; it softens at a moderate heat and, if not contaminated by dust or handling, it welds perfectly.

## REFINING GOLD.

DR. W. C. BARRETT, BUFFALO, N. Y.

Dental Practitioner and Advertiser, January.

In melting scrap gold, filings, etc., care should be taken to see that it is quite clean, and free from organic matter, etc. It is a good plan to heat the scrap in an iron ladle until all wax, greese, etc., are removed, before placing in the crucible for melting. Always melt old gold by itself, using sal ammoniac and charcoal in equal quantities as a flux. When the ingot has been cast and

cooled, test its malleability by rolling or hammering. If it should split when rolling, it is due to the presence of some foreign metal, such as lead, tin, iron or steel. If the latter, the ingot should be broken up and remelted with two parts of carbonate of potash and one part of nitrate of potash. The flux will combine with the iron or steel, leaving the gold free. Then cast and try the ingot as before. If the impurity be lead or tin, the metal will be very brittle, and when broken the grains will be close and pale. A very small quantity of lead or tin will render gold too brittle to work. It must then be remelted as before, using as a flux two parts of charcoal to one of corrosive sublimate, breaking the gold into small fragments, and mixing thoroughly with plenty of flux while melting. In this remelting so often, a serious loss in weight occurs, due to the elimination of the foreign metals; for this reason old gold should be melted and refined separately before using it to make alloys, otherwise the refiner will be seriously out in his calculations, and the resulting alloy will not be of the grade desired.

Filings should be spread on paper or glass, and a strong magnet passed over and among them repeatedly, to take out as much iron and steel as possible before putting in the crucible. This is a very simple method, and it will often save one or two remeltings, if attended to before commencing operations. Or the filings may be placed in a tall bottle, covered with a solution of one part of sulphuric acid to eight of water, shaken up and allowed to stand for some time. The acid will dissolve out the iron, steel, tin, copper and zinc filings, leaving the noble metals untouched. When all is dissolved, throw away the solution and wash the filings several times with pure water. Then dry and heat them as before described. It is best to waste the solutions and wash the filings through filter paper, in order to avoid the loss of very fine particles of gold floating in the liquids.

By thus remelting scrap separately, the refiner can come reasonably near to a homogeneous alloy to start with, and he can then raise or reduce its quality, or color it much more easily and certainly, than if attempting to mix scrap, filings and new gold at one operation.

Plumbago crucibles should be used, as they are far the best for melting metals requiring a high degree of heat, and with care they will stand from twenty to fifty heatings. If using a new

crucible, a little powdered charcoal should be put into it along with the metal. This will coat the surface of the plumbago, and prevent the melted metal from sticking to it.

The pouring of the gold into the ingot mold requires some dexterity and practice. It must not be done so slowly as to allow the stream of metal to run down the sides of the crucible; neither should the stream be so small as to chill the metal before entering the mold, or imperfect castings will result, and give trouble in rolling the ingot. On the other hand, the stream should not be allowed to strike with force enough to slop over the mold, making rough and uneven castings. The flux floating on the surface of the metal should be prevented from passing into the mold with the metal by using a thin piece of dry flat wood, held with the left hand at the lip of the crucible while pouring. Poplar is the best, as it burns very slowly. The warming and greasing of the ingot mold should also be attended to carefully. If it is too cold or too hot the metal will spit and fly about on being turned into it. It should be so hot as just to allow touching with the hand for a second or two. If these details are carefully attended to, smooth, tough and malleable castings are pretty sure to result.

## VARIOUS BLOWPIPE FLAMES.

Dental Practitioner and Advertiser, January.

Thomas Fletcher, the well-known expert in practical metallurgy, gives the following directions for the use of the blowpipe:

The flames may be separated into two classes. Those used for blowpipe analysis are produced by air jets of small bore, and as smooth as possible inside; the theoretically perfect jet is made of glass tube drawn out small, and broken off where the required bore exists. The advantage of this jet is the perfect smoothness of the bore, which enables the operator to produce perfectly defined flames, with the reducing and oxidizing zones large and clearly defined. The disadvantage of the glass jet is its delicacy and constant liability to injury. Next to this comes the platinum tip, which remains fairly smooth inside; and last of all comes the simple and cheap brass nozzle so universally used. The flame in this class of blowpipe is produced by an air pressure low enough to prevent the

breaking up of the blue cone, the tip of which is the hottest part; inside this blue cone is the reducing flame; beyond it is the oxidizing zone. For brazing and soldering, a heavier air pressure and a larger bore jet are required; the blue cone is broken up, and the different zones of flame are much less clearly defined, and in practice are much less important. The flame is still roughly divided into a blue, or greenish-blue center, and an outer yellowish mantle, surrounding and projecting beyond the blue. The rough point of the latter is, as before, the hottest part, and this should touch the work to be brazed. It has a distinctly ozidizing action; but this is overcome in practice by the protection of the flux used, which must have the power of dissolving oxides.

## TREATING SYRINGES.

Medical Brief.

Syringes, whose canals have become obstructed so that a fine wire cannot be drawn through, are cleaned by holding them a moment over a flame; the foreign substance is thus quickly destroyed and driven off. If a wire has been rusted into the needle it should be dipped in oil before holding over the flame. To remove the rust from the interior of the canula, it is well to pass oil through the canula, then heating it, then rinse it out with alcohol.

## CELLULOID COVER FOR OPERATING TABLE.

International Dental Journal, April.

Dr. George Allan says a celluloid sheet makes the cleanest and best covering for the operating table.

## POLISHING POWDERS.

International Dental Journal, April.

In speaking on this subject, Dr. George Allan says diamond and Hindostan powders mixed, make the best polishing powder for enamel. A little of it goes a long way. He uses it with a copper

point, or take an old bur, heat it and soften it and take off the bur part so to have simply a rounded part, dip it in oil of cloves or oil of wintergreen and use it, and it is astonishing how rapidly it works, and what a bright, clean surface it gives. He says Hindostan powders, of different grades, are the best for polishing fillings.

## FUSIBLE METAL FOR SMALL DIES.

DR. W. DUNN, FLORENCE, ITALY.

| | |
|---|---|
| Metallic bismuth | 4 parts. |
| Lead | 1 part. |
| Tin | 1 part. |

Make an alloy which will melt at the temperature of boiling water, and therefore can be poured without any fear of spluttering in damp molds; it can be run into a plaster impression or into clay; it is quite hard enough for small dies and counterdies. The addition of two parts cadmium to this alloy will give a metal that can be poured, with care, into a modeling-compound impression.

## SOLDER FOR COIN GOLD.

DR. T. F. CHUPEIN, PHILADELPHIA.

Dental Office and Laboratory, September.

| | |
|---|---|
| Gold | 2 dwt. |
| Copper | 9 grs. |
| Silver | 3 grs. |
| Zinc | 1 gr. |

## SILVER SOLDER.

DR. T. F. CHUPEIN, PHILADELPHIA.

Dental Office and Laboratory, September.

| | |
|---|---|
| Silver | 16 parts. |
| Copper | 3 parts. |
| Zinc | 1 part. |

## A SOFTER SOLDER.

| | |
|---|---|
| Gold | 2 dwt. |
| Copper | 8 grs. |
| Silver | 5 grs. |
| Zinc | 5 grs. |

## A SOFTER SOLDER.

| | |
|---|---|
| Silver | 48 parts. |
| Copper | 8 parts. |
| Zinc | 5 parts. |

## CORK MANDREL FOR SANDPAPER.

DR. A. A. BURNS, SMITHS FALLS, ONT.

Dominion Dental Journal, July.

A handy sandpaper mandrel may be made out of cork for use on rubber plates in finishing process. Take a common quart-taper cork. Trim up in cone shape on the lathe. By means of dental mechanical saw make a slit through apical end of cone about half way down. A piece of sandpaper, a little wider than the opening, bent back at one end for retention, and placed in the mandrel, will complete it. This will be found more pliable than the common brass mandrel. It conforms more with depressions in outline of plate, retains sandpaper better and does not heat plate so quickly.

## MAKING AMALGAM.

DR. HATHAWAY.

International Dental Journal, September.

My process is simply this: With a well-ignited coal fire in my laboratory stove—or, better, with a charcoal fire—the crucible, first rubbed over the inside with borax, is gently heated and the tin melted first, then the silver is added in small pieces, and the melting mass, which is kept at as low a temperature as possible, is

stirred with a clay-pipe stem or an oak stick. As soon as the silver is melted, the gold, or copper, whichever is used, is added—the copper in the form of wire rolled as thin as possible. As soon as the melting is complete it is quickly turned into a cold ingot mold; then all that remains is to file with a somewhat coarse file, and remove bits of steel with a magnet, and the alloy is ready for use.

Two formulas which I make constant use of are given, viz:

| | |
|---|---|
| Silver.....55 parts. | Silver..... 45 parts. |
| Tin.....40 parts. | Tin.....45 parts. |
| Copper..... 5 parts. | Gold.....10 parts. |

One gives a black amalgam, the other light gray; both have good edge-strength, shrink but little, and take a good polish. I have made many others, but these are my main reliance.

The four metals named are the only ones I consider of value. Platinum seems to me to be nearly or quite inert, and zinc, while it gives whiteness, gives also a greasy feel which I detest, and I suspect it tends to cause weak edges and the spherical form in crystallization. Of the latter I am not definitely certain, but do not now use it in my alloys.

## HAMMER; RUBBER FACED.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Dominion Dental Journal, March.

Slip a rubber tip, such as is used on the little glass drop tubes, over point or face of your small riveting hammer, tie it fast with a piece of wire twisted round; you can hammer away at a plaster model without defacing it, when fitting in an air-chamber pattern or any piece of gold, or other metal, to the model.

## CANAL DRIER.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Dominion Dental Journal, January.

Take a piece of copper, trim to size and shape of a good-sized marrow-fat pea, drill a small hole clean through it, take a piece of piano wire a little larger than the hole in the copper, file or grind

it down to a nice taper like a heavy broach, drive it through the hole in the copper as far as it will go and set the thick end into a small handle of any kind; you can heat the copper and it will retain the heat and keep the wire hot for a long time. The wire can be made as fine as you wish for entering any canal by using disks of sandpaper used on a mandrel in the engine; place these disks face to face and put cardboard at the back of each disk to stiffen the sandpaper disks.

## MERCURY; TO PURIFY.

DR. D. V. BEACOCK, BROCKVILLE, CAN.

Dominion Dental Journal, March.

Hydrochloric acid has no effect on mercury; sulphurid acid must be heated to effect it much; nitric acid acts on it lightly; by taking advantage of this, mercury can be purified easily from lead and many other base metals or impurities with which it is often mixed. Using one part acid to eight parts water, heated to 140 F., will not attack the mercury, and is sufficiently strong to eat up the baser metals the mercury may contain. Another way to purify mercury is to shake it well in pulverized sugar, then filter through a paper cone by making pin holes in the bottom of it. The mercury will filter through, leaving the sugar in the paper.

## FUSIBLE ALLOY.

DR. B. A. MOYER.

Items of Interest, December.

An alloy that will melt at 200° F. This is valuable for crown and bridge-workers. It may be poured directly into a plaster impression of the teeth without the necessity of drying the plaster.

| | |
|---|---|
| Lead | 2 parts. |
| Bismuth | 4 parts. |
| Tin | 1 part. |
| Cadmium | 1 part. |

Melt in order given.

## CALCULATING CARAT OF GOLD.

Dental Record, February.

The English sovereign is 22 carats fine, weighs 123¼ grs. and contains 113 grs. pure gold. Four contain 1 dwt. 17 grs. copper, and these may be reduced for 18 carat plate by adding 3 dwts. 2½ grs. silver, and 1 dwt. 9½ grs. copper. Fifteen carat solder is made with coin gold, of coin 144, silver 30, copper 20, and brass 10 parts.

Professor Watts's rule for reducing gold to a required carat may be mentioned with advantage, and is expressed thus:

As the required carat is 24, so is the weight of the pure gold used to the weight of the alloyed mass when reduced; the weight of gold subtracted from this gives the quantity of alloy to be added. 7¾ grs. of alloy added to 1 dwt. of 22 carats fine reduce it to 18 carats. To raise it to a higher standard Gee adds 13 dwts. 8 grs. of fine to the ounce of 9 carat gold to make it 15 carats fine. Richardson adds to each dwt. of 16 carat one-half dwt. of 22 carat to raise the carat to 18. From this the amount of fine gold to be added to any alloy to make it of a higher carat may be calculated.

To ascertain the carat of an alloy, the proportions of the metals composing which are known, the rule is as follows: As the weight of the alloy is to the weight of the gold it contains, so is 24 to the standard sought.

## LABORATORY PADS AND HOLDERS.

DR. W. H. STEELE, FOREST CITY, IOWA.

Items of Interest, May.

Pads and holders that are non-conducting and will not scorch are very convenient when soldering, baking, etc. These can be easily made by any dentist at a cost of a few cents each. Procure at the plumbers some asbestos paper, such as is used for covering hot-air pipes; get some of each, the thinnest and thickest grades, use the thin for making holders and thick for bench pads, the latter to protect the bench from hot flasks, soldering, etc. Cut the paper into sizes and shapes desired; now lay these pieces on some heavy flannel; cut out the pieces of flannel one inch larger on all sides

than the asbestos; turn the edges up over the paper and stitch fast. In using these always have the asbestos side of the holder or pad next to the hot surface.

## TO CLEAN IMPRESSION CUPS.

DR. R. B. FOSTER.

Items of Interest, May.

To clean and brighten impression trays place them in a vessel of water, to which has been added several tablespoonfuls of "Pyle's Pearline," and boil for a few minutes. While hot rub dry with a rough towel, and the trays will be as clean and bright as when new.

## MODELING WAX.

PROF. CALI, NAPLES, ITALY.

Agenda M. C. Odontojatrica.

Gum copal ..... 1 part.
Stearine ..... 1 part.
Powdered chalk ..... 2 parts.

Melt together, color with carmine and flavor.

## SOLDERING ALUMINUM.

Giornale di Corrispondenza.

The difficulty in soldering pieces of aluminum will be easily overcome by painting the edges to be soldered with a solution of chloride of silver. The solder will then flow freely.

## SOLDER FOR IRON OR BRASS.

Reforma Dentistica.

Tin ..... 3 parts.
Copper ..... 5 parts.
Zinc ..... 5 parts.

## TESTING VULCANIZERS.

DR. W. DUNN, FLORENCE, ITALY.

By means of a small force-pump that will drive water through a small tube into a vulcanizer, this can be tested to four or five times the pressure it usually undergoes in use. The water-test involves no danger whatever; a small hydraulic force-pump can be made at a few dollars cost by any intelligent mechanic. Any pressure-gauge can be adapted, and the appliance is always ready for use.

## PRESERVATION OF COCAINE SOLUTIONS.

PROF. CALI, NAPLES, ITALY.

Agenda M. C. Odontojatrica.

A two per cent. solution of boric acid, added to solutions of cocaine will prevent decomposition for several months.

## AMBER VARNISH.

DR. C. F. IVES.

Procure a piece of clear amber, scrape or powder it, dissolve in Squibb's chloroform, which will take some time, add a little absolute alcohol to delay evaporation, and you have a varnish so hard that it will resist almost anything.

## CLEANSING THE HANDS.

L'Odontologie, September.

For any one who may wish to have soft, white hands, the following is recommended:

℞ Lanolin.....30 parts.
Glycerine.....20 parts.
Borate of soda.....10 parts.
Oil of eucalyptus..... 2 parts.
Essence of bitter almonds.....25 drops.

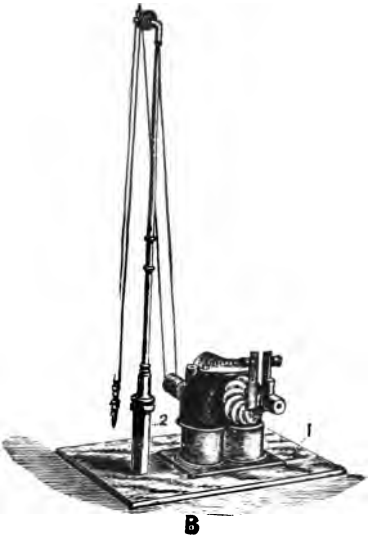
M. Sig.—Rub the hands and cover them with gloves at night.

# AN ECONOMICAL ELECTRICAL MOTOR.

DR. W. H. STEELE, FOREST CITY, IOWA.

Ohio Dental Journal, August.

One motor, if a good make, will answer all purposes, and can be made to run the engine, engine mallet, fan, laboratory lathe and a dynamo for electro crown and bridge work, or gold and silver plating if desired. The base of the motor will not be heavy enough for this purpose as it comes from the maker; it will be necessary to have a hard wood base made like No. 1 (see cut B); to this have a strong piece of hard wood turned upright (Fig. 2), fitted, of proper




B

height and size, so that your engine standard will fit firmly on to it. By this means you will not need to throw away the engine, and can instantly change from wheel to motor. The battery (if local or storage) should be placed just inside the laboratory door, with the wires running up through swivel hangers in the top of the casing. When needed in the laboratory, slip off the standard, carry the motor in and place it on the bench or floor; with four screw-eyes, through the corners of No. 1, fasten it down firmly, put on the belt and go to work. A fan can be put up in front of the operating chair and run with the motor at the same time in conjunction with the engine, by having two grooves on the

pulley. The current for running the motor can be taken from electric light wires, furnished by a storage battery or (where there is no electric light plant) by a self-generating battery. A motor, suitable for this purpose, can be got for $18.00 to $22.00, and if in a city where there is no electric power, it can be run with a local battery of four to six cells; costing from $2.50 to $3.00 per cell, or with a storage battery.

## PREPARATION OF OXYPHOSPHATE CEMENT.

DR. W. DUNN, FLORENCE, ITALY.

Pour nitric acid on oxide of zinc and keep stirring with a glass rod till all effervescence ceases. Lay aside for a few hours to insure a perfect mix, then put into an ordinary white crucible and lay on a clear fire with a good chimney above to draw the nitrous fumes away. When the red vapors have entirely ceased, the crucible and contents will be at a white heat, and should be left to cool gradually by letting the fire burn out.

The heating and cooling should take from six to ten hours. The crucible will have to be broken away from the hard, stony mass inside, which, when pounded and very finely pulverized constitutes the cement powder.

The liquid is prepared by boiling glacial phosphoric acid with just enough distilled water to make a thick liquid. Too much water will make the cement set too quickly and crumble, whereas too little water gives a mix that will not harden for hours.

## TO MAKE DRILLS FROM OLD BURS.

DR. B. BANNISTER, KALAMAZOO, MICH.

The drills are made without drawing the temper by grinding as follows: Put on the lathe a six-inch emery wheel, No. 90 grade. Put the bur in engine hand piece. Have an assistant to run the lathe. Lay the drill on the lathe laterally and run the engine in an opposite direction to the lathe wheel. Run both about the same speed. This assures a perfectly true drill.

## PARAFFINE OIL ON SHARPENING STONES.

Reforma Dentistica.

Instead of sperm or olive oil, paraffine oil can be used on Arkansas stones; it will keep the stone clean and give a sharper edge to excavators and tools.

## TEMPERING TOOLS.

German engravers harden their tools, says the British Mechanic, by heating them to a white heat and then plunging them into sealing wax, continuing the operation until the tool is cool. By this method the steel becomes almost as hard as a diamond, and, when touched with a little oil, is excellent for engraving or for drilling into other metals.

## MELTING POINTS OF ALLOYED GOLD.

Gold is supposed to melt as follows: 23-carat, 2,012° F.; 22-carat, 2,009°; 20-carat, 2,002°; 18-carat, 1,995°; 15-carat, 1,992°; 13-carat, 1,990°; 12-carat, 1,987°; 10-carat, 1,982°; 9-carat, 1,979°; 8-carat, 1,973°; 7-carat, 1,960°.

## TREATING BURNISHERS.

DR. R. B. WINDER, BALTIMORE.

Southern Dental Journal, February.

Get a very thick piece of sole leather from a shoe maker, and with a sharp knife cut a small groove the whole length of the piece. Sprinkle rouge in the groove and rub briskly until the burnisher is perfectly bright. Keep a small piece of white soap convenient, and before using the burnisher rub a little of this on the filling. The plugger marks and other scratches must be removed with pumice stone and polishing strips, after which use the burnisher with a light touch—pressure is unnecessary—and the result will be a surface that can be obtained in no other way.

## MUSLIN NAPKINS.

DR. D. J. WAIT, HELENA, MONT.

Take a bolt of thin unstarched muslin to the book-binder and get it cut into squares three by three and one-half inches, larger or smaller as may be desired. A whole bolt may be cut up in this manner in a few minutes, leaving the edges of the pieces even and smooth. As they are taken from the cutting-machine in blocks lay them in a box to keep them smooth and clean. They are particularly useful in extracting and also in amalgam work where it is not desirable to use the rubber-dam. After once trying this way, no one will feel like doing without them.

## DUNN'S AMALGAM.

DR. EDWARD DUNN, FLORENCE, ITALY.

| | |
|---|---|
| Brass | 3 parts. |
| Gold | 1 parts |
| Silver | 56 parts. |
| Tin | 40 parts. |

The amalgam made with filings of this alloy keeps an excellent color and may be used in front teeth. It has good edge-strength and sets rapidly.

## TO MAKE CORUNDUM POINTS ON OLD BURS.

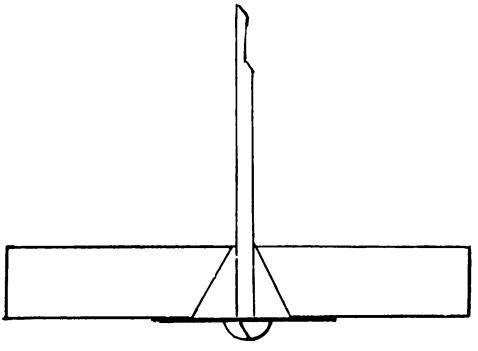
DR. B. BANNISTER, KALAMAZOO, MICH.

Dip the bur in shellac varnish and hold in a flame a moment to remove the alcohol, or coat the instrument with gum shellac by warming it, either way, to get a coating of shellac on the mandrel or bur. Take old corundum wheel, soften and knead corundum on the point of instrument; resoften, and with a steel spatula on a marble slab, roll the point out pill-mass fashion. Any shape may be given it. It is well to immerse the points in solution of caustic potash a few minutes, to remove the glazed surface. By grinding down the burs, as in making the drills from old bur, (as illustrated elsewhere) very small corundum points can be made. The potash is good for cleaning corundum wheels.

## TO COUNTERSINK HARD RUBBER DISKS FOR USE WITH SANDPAPER DISKS.

DR. B. BANNISTER, KALAMAZOO, MICH.

A piece of steel is made with a V-shaped hole in it. The cut shows sectional views of steel, screw mandrel and disk in place.



Put disk on mandrel, pass mandrel through the steel mold into the engine hand piece. Warm the rubber disk carefully, rotate the engine and draw the disk into the form to suit any shape desired. The disks may be trued, if necessary, by holding them against sandpaper, while revolving the engine.

## RESTORING RUBBER BANDS, ETC.

Rubber bands, tubes, etc., that have lost their elasticity and easily snap, may be restored by steeping for half an hour in dilute water of ammonia (aq. ammonia 1 part; water 2 parts.)

## TO CUT SOFT RUBBER.

DR. W. H. STEELE, FOREST CITY, IOWA.

Dental Tribune.

It is quite difficult to cut soft, or unvulcanized rubber, as it will stick to the shears. To overcome this trouble, dip the shears or knife in water occasionally. This is equally useful in trimming or sharpening bands or other appliances of soft rubber.

## JEWELERS' BROACHES.

Jewelers' broaches, with the temper drawn, are excellent for reaming out root canals, carrying cotton or silk shreds for cleansing or medicating. [Remove temper by heating in a glass tube. Detailed elsewhere in COMPENDIUM.—EDITOR.]

## WRENCH FOR OPENING WHITNEY VULCANIZER.

DR. W. H. WRIGHT, BRANDON, VT.

Ohio Dental Journal, July.

Have a long handled malleable iron wrench, which a village blacksmith can make, for the top of the boiler, and place this in position and lay the vulcanizer on its side on the bench and hit the long handle of the wrench a smart blow or two with a hammer; the work is done without friction to hands or feeling.

## PLIERS FOR CARRYING SANDPAPER STRIPS AND DISKS.

DR. PERRY, NEW YORK.

International Dental Journal, July.

A pair of pliers designed for carrying sandpaper strips.—The beaks are curved at the right angle and are made round and smooth, so that, in using them, the strips do not tear, as with ordinary pliers which have sharp edges. Another pair, made for holding very small sandpaper disks in order to use them as one would a file for finishing gold fillings near and under the margin of the gums. They are made flat, with one beak longer than the other, to support the disk and hold it to its work. On the other beak is soldered a little spur, which passes through the hole in the disk and keeps it from slipping. These disks, used in this way, do not cut rapidly, but they give a finer finish than can be made with files. They slip up under the gum and do their work without cutting or tearing that tissue. Of course, they are only to be used in inaccessible places, where the same disk attached to a revolving mandrel cannot be applied.

## SOLDERING BLOCK.

DR. F. A. GREENE, GENEVA, N. Y.

A piece of charcoal invested in plaster and marble dust makes a neat and inexpensive soldering block.

## SOLDER FOR ALUMINUM.

The Keystone.

It was originally intended for soldering aluminum-bronze, but I have used it on aluminum spectacles with satisfactory results.

| | |
|---|---|
| Copper | 52 parts. |
| Zinc | 46 parts. |
| Tin | 2 parts. |

Copper wire can be made use of in making the alloy, and sheet-zinc can be employed; but only grain-tin or other pure tin, to be had at the druggists, should go into the solder. The above proportions in grains or pennyweights can be melted and compounded on charcoal or asbestos. Melt the copper first, and add the zinc a little (say one-sixth) at a time, keeping the metal no hotter than is necessary to preserve the fluidity; then add the tin. About sixty parts of zinc can be used in such a melting, as some of it will burn out. After the solder is cold, weigh it to see if it comes out to the even hundred parts; if it weighs less, zinc must be added to make up the deficiency; if it weighs more, another melting will probably burn out enough of the zinc to bring it to the proper proportions. Such solder is brittle, but it can be hammered some. Borax is the flux to employ.

## SOAP FOR THE HANDS.

Dental Office and Laboratory, January.

To whiten the hands, melt a pound of white castile soap over the fire with a little water. When melted, perfume slightly with any one of the extracts, and stir in half a cupful of common oatmeal. Use this preparation when washing the hands, and be surprised at the improvement in their appearance.

## COVER FOR BRACKET TABLE.

Cut heavy white or light pink paper to fit the table and use in the place of napkins; or remove the rim from around the table and replace it with a higher one, cut a piece of paper to fit and over this cut and fit a pane of glass. The paper shows up the instrument and the glass is easily kept clean.

## TO CLEAN IMPRESSION CUPS.

Dr. F. A. Greene, Geneva, N. Y., says boil them in sal-soda water.

## SOLDER FOR ALUMINUM.

Engineering and Mining Journal.

| | |
|---|---|
| Tin | 80 parts. |
| Zinc | 20 parts. |

To be used with a flux composed of—

| | |
|---|---|
| Stearic acid | 80 parts. |
| Zinc chloride | 10 parts. |
| Tin chloride | 10 parts. |

## CHLORO-PERCHA AS A DRESSING FOR WOUNDS.

DR. J. S. LETORD, KANSAS CITY, MO.

Dental Review, May.

He has found chloro-percha to be an excellent dressing in burns, contused or incised wounds, of not too great a magnitude. A thick solution made of gutta-percha in chloroform, properly applied, will close a wound, preserve the parts in suitable coaptation, shelter them from contact with air, protect them from foreign agents, whether mechanical or chemical. Keep the surface of the solution of continuity at an even temperature; consequently the

parts are kept aseptic, and union by first intention without pain is the result.

Wounds which usually require sutures to bring their margins in apposition are successfully treated with the solution. It is manifest that the application of this solution to burns will be desirable, and experiments have demonstrated such to be the case. The pain is always almost instantly alleviated in wounds of the gum after extracting.

The application of this styptic and splint, if you please, is both grateful to the patient and pleasant to the surgeon. The socket in the alveolus is filled with a pledget of cotton dipped in the chloro-percha and allowed to remain until it is forced out by the contraction of the tissues. In ordinary open wounds, neither suture nor bandages are required; simply apply the chloro-percha and the wounds will heal, not only perfectly and well, but without pain or inflammation.

Fissures of the lips, margins of the eyelids, and fissures of the rectum are markedly benefited and cured by the application of chloro-percha. In extensive wounds of the fingers, when a splint is needed, the continued application of the chloro-percha, one coat after another, until the desired quantity is reached, is all that is necessary.

## FOR BURNS.

Pinus canadensis cannot be too highly recommended as an application to burns, especially when very extensive, the skin being entirely removed. A weak solution in glycerine is squeezed from a sponge over the denuded surface, which is then dressed with some soft ointment, either with or without the pinus canadensis. Pain immediately abates, and the healing process is wonderfully rapid. The solution must be freshly applied as often as the dressings are renewed.

## IMPROVED GUTTA-PERCHA STOPPING.

Dental Tribune.

Take base plate gutta-percha, dissolve in chloroform, allow the chloroform to evaporate. This makes a superior stopping.

## HARD WAX.

White wax ..... 4 oz.
Gum dammar ..... 2 oz.
Resin ..... ½ dram.

Melt the wax, then add the dammar, stir occasionally until the dammar is dissolved, then add the resin.

## SUPPORT FOR SMALL PIECES WHILE FILING.

DR. G. A. M'MILLAN, ALTON, ILL.

Dental Review, March.

If you have occasion to file the crown part (cusp part) of a gold crown or other small piece of metal, try setting it by heating it into a piece of sealing wax, allowing the crown to get cold, then file to the desired shape; this will save you trouble. When you want to remove it from the wax also heat it.

## EXPLORING INSTRUMENTS; TO MAKE.

DR. C. S. HARDY, SUMMIT, N. J.

Items of Interest, July.

The writer says take Sharp's needles, No. 4, draw the temper and bend them in any desired shape. The broach holder makes a good handle.

## ALUMINUM SOLDERS.

Der Techniker, July.

No. I. Pure tin, melting point 250°.

No. II. One thousand grams pure tin, fifty grams lead, melting point 280° to 300°.

No. III. One thousand grams pure tin, fifty grams tin, melting point 280° to 320°.

These do not discolor the aluminum, but leave its surface quite intact, and are therefore well adapted for the manufacture of ornamental articles, etc.

No. IV. One thousand grams pure tin, ten to fifteen grams copper, melting point 350° to 450°.

No. V. One thousand grams pure tin, ten to fifteen grams nickel, melting point 350° to 450°.

Solders IV and V color the aluminum yellowish black; they possess, however, a greater degree of strength, and are especially adapted for the manufacture of such articles as have heretofore been made with tinned iron, white metal, copper, zinc, brass, nickel, etc., as well as for all aluminum articles which may be used in building work, and which are now constructed of zinc, white metal and lead.

In contrast with the rapidly oxidizable metals aluminum possesses an almost unlimited durability.

No. VI. Nine hundred grams pure tin, one hundred grams copper, two to three bismuth, melting point 350° to 450°.

This yellow solder is adapted for the soldering of aluminum bronze. The color may be changed by the addition of more or less copper. By varying the amount of bismuth a melting point may be obtained which permits of the use of the soldering iron. This solder is also adapted for the soldering of aluminum to copper, zinc, brass, iron, white metal, nickel, etc.

## ALUMINUM SOLDER.

Engineering and Mining Journal.

Tin ..... 80 parts.
Zinc ..... 20 parts.

To be used with a flux composed of—

Stearic acid ..... 80 parts.
Zinc chloride ..... 10 parts.
Tin chloride ..... 10 parts.

## REFINING SILVER SCRAPS.

The Keystone.

A very simple and efficient method is to dissolve your old silver in nitric acid, stimulating the action of the acid by heat toward the end of the operation. Strips of sheet copper placed in

the acid solution will cause the silver to be precipitated in a fine gray powder, which should be washed and dried, and melted with sal tartar in a crucible. Silver refined in this way is almost absolutely pure.

## INSTRUMENT POLISHER.

DR. J. G. TEMPLETON, PITTSBURG, PA.

Ohio Dental Journal, January.

Burnishers give better results when new than when tarnished, and it is essential to keep them finely polished. In fact, it is desirable to keep all instruments polished. An efficient device for polishing can be made by fastening a piece of sole-leather or a piece of razor-strap, on a block of wood of suitable size, and placing a little diamantine powder on the surface of the leather; then polish instruments by rubbing briskly on this surface. Diamantine is used by jewelers and can be obtained from them or from their supply houses.

## HYDROGEN FLASH LAMP.

W. S. ELLIOTT, SAG HARBOR, N. Y.

Items of Interest, August.

Take a two-dram bottle, into which fit a cork perforated to admit tightly an ordinary glass medicine dropper, small end uppermost, and the taper portion bent at right angle; the orifice also made fine by heating it in the Bunsen burner till it contracts a little. To use it enclose in the bottle a piece of granulated zinc the size of a pea, and a little less than a dram of sulphuric acid and water. The result will be the evolution of hydrogen gas, which, as it issues from the tube, may be set on fire. The heat is intense, and, if carefully manipulated, the instrument will be found more satisfactory in every respect than the ordinary flash lamp. If the flame is too large, as it is apt to be at first, a few moments' waiting will see it diminished, as the pressure of the gas in the tube is lessened. It is better to freshly charge the bottle every time it is brought into use.

## TO DRILL GLASS.

The Keystone.

Make a drill convex on the edge, and to cut both ways, like a drill to use with a bow; set the drill in a wooden handle, and rotate it by hand, keeping the glass wet with turpentine. Drill half way through, and then commence from the opposite side. After the holes meet, finish with a rat-tail file wet with turpentine.

## CLEAN SOFT HANDS.

DR. A. C. HEWITT, CHICAGO.

Dental Review, June.

Clean, soft hands, whether old or new, are still useful. The successful busy dentist must sometimes handle flask, file and forge; he must occasionally hold the crucible, the die and the scraper; he must sometimes grind at the lathe, and polish at the buffer. His hands get soiled. Soaps? Yes, if scentless, or at most, of the daintiest odor. These will not always whiten. The following is excellent:

℞ Pulv. acidum boracicum ..... lb. i.
Pulv. sodæ carb. ..... lbs. ii.
Pulv. pumice ..... lb. i
Glycerine q. s. to form paste.
Sig.—Use as a soap.

If hands are stained as with nitrate of silver, wet the stains and rub with cyanide of potassium, then wash. Never apply soap first as that sets the stain. This paste is searching in action. An emollient should follow, and as perfumes are not always agreeable to the patient, especially in the mouth, nothing is better to soften, smooth and render the hands agreeable than the following lotion:

℞ Liq. potassæ arsenitis ..... Fl. ʒ iv.
Glycerine ..... Fl. ʒ iii.
Bay rum ..... Fl. ʒ xvi.
Aq. pura ..... ad ..... Fl. ʒ xxxii.
Sig.—Lotion for hands, face, etc.

After washing with the paste and drying with a towel, moisten

the hands with the lotion and let it evaporate. In making this lotion use only the best of bay rum; that distilled from the bay leaf, not bay oil and alcohol.

## PREPARED GLUE.

The Keystone.

An excellent glue is made by soaking best white glue over night in cold water, using just enough water to fully swell the glue out. Any excess of water should be drained off, and enough glacial acetic acid poured on to cover the soaked glue. Heat to dissolve the glue, after which it is placed in bottles for use. The bottle should be warmed when the glue is to be used. Add to above about five per cent. of bichromate of potash, and the glue is insoluble after drying. Add a few drops of glycerine, and the glue dries elastic.

## POLISHING SILVER OR GOLD.

The Keystone.

For illustration, let us take a silver coin (say a quarter of a dollar) and smooth and polish it for engraving. The first process is to turn or file off the face of the coin. Even this should be conducted with an eye to the subsequent perfect surface produced by polishing; that is, let every operation do as much as possible toward the final perfect surface. In filing, for instance, there would be no object in employing a fine file in which pins or small lumps of metal were allowed to accumulate, which produce deep gutters across the face of the coin only to be removed by some subsequent process. When we come to removing file-marks, fine emery can be employed, or pumice stone powder; but, in all instances, let no coarse particles interfere with the gradual advance of the smoothing process. For employing rotten-stone or tripoli, a stiff, round brush in a polishing-lathe is the tool to use, mixing the rotten-stone or tripoli with oil to a thick paste—kerosene does well. After all scratches are removed, wash the article well with soap and water to remove every particle of the rotten-stone, or the

subsequent polish will be milky. Do not think you can handle the work with gritty, dirty hands. Everything must be absolutely free of grit from former smoothing operations. The rouge-polish is produced by first brushing with round bristle-brushes in the polishing-lathe, using rouge mixed with oil, or rouge tablet, followed by buffing with a rotary buff made of cotton-flannel or elk-leather, making use of best plate rouge wet with gin, which experts claim to be better than alcohol. The final black polish is obtained just as the rouge gets black and dry on the buff, and is really produced by a film-surface on the buff of the metal we are polishing.

## COATING ALUMINUM WITH OTHER METALS.

Scientific American.

Professor Neesen demonstrated before the Physical Society of Berlin, a method of coating aluminum with other metals. This consists in dipping the aluminum in a solution of caustic potash or soda, or of hydrochloric acid, until bubbles of gas make their appearance on its surface. Whereupon it is dipped into a solution of corrosive sublimate to amalgamate its surface. After a second dipping into caustic potash until bubbles of gas are evolved, the metal is placed in a solution of the salt of the desired metal. A film of the latter is rapidly formed, and is so firmly adherent that, in the case of silver, gold or copper, the plate can be rolled out or polished. When coating with gold or copper, it is well to first apply a layer of silver. When thus treated the aluminum may be soldered with the ordinary zinc solder.

## REFINING ALLOY OF GOLD AND SILVER.

The Keystone.

Either roll it into sheets as thin as thin paper, or granulate the alloy by pouring, while melted, into a bucket of water stirred so as to revolve rapidly while the alloy is being poured in. For every ounce of alloy take one ounce of nitric acid and two ounces of

water, and place the alloy in it, letting stand for several hours; then apply heat if all the alloy is not dissolved. The brown powder in the bottom of the vessel is pure gold. In case the alloy is not all dissolved, add more acid. The gold which lies in the bottom is washed with water, dried, and mixed with sal tartar and fused in a crucible. The dilute acid which is poured off should now be treated for the silver by adding twice the volume of water, and then pouring in muriatic acid as long as any white precipitate is formed. Let the precipitate settle, and then pour off the supernatent acids. Add pure water, let settle, and pour off, dry the precipitate and fuse with sal tartar. Instead of adding muriatic acid to the acid containing the silver strips of copper can be placed in the solution, when the silver will settle on them and can be scraped off and melted.

# PUBLICATIONS.

## DENTAL JOURNALS.

AMERICA—MONTHLY.

American Journal Dental Science, Baltimore, Md., 9 West Fayette St. Editors, F. J. S. Gorgas, A. M., M. D., D. D. S., Richard Grady, M. D., D. D. S. Publishers, Snowden & Cownan. Price $2.50.

Dental Cosmos, Philadelphia, Pa., Chestnut, cor. Twelfth St. Editor, E. C. Kirk, D. D. S. Publishers, S. S. White Dental Manufacturing Co. Price $2.50.

Dental Register, Cincinnati, Ohio, 117 West Fifth St. Editors, J. Taft, M. D., D. D. S., W. H. Whistlar, D. D. S., N. S. Hoff, D. D. S. Publishers, S. A. Crocker & Co. Price $2.50.

Dental Review, Chicago, Ill., 66 Madison St. Editors, C. N. Johnson, L. D. S., D. D. S., T. L. Gilmer, M. D., D. D. S., George J. Dennis, M. D., D. D. S. Publishers, H. D. Justi & & Son. Price $2.50.

International Dental Journal, Philadelphia, Pa., 716 Filbert St. Editors, James Truman, D. D. S., Geo. W. Warren, D. D. S. Publishers, International Dental Journal Publication Co. Price $2.50.

Items of Interest, Philadelphia, Pa., 1413 Filbert St. Editor, T. B. Welsh, M. D. Publishers, Wilmington Dental Manufacturing Co. Price $1.00.

Ohio Dental Journal, Toledo, Ohio. Editor, L. P. Bethel, M. D., D. D. S. Publishers, Ransom & Randolph. Price $2.00.

Pacific Coast Dentist, San Francisco, Cal. Editor, J. D. Hodgen, D. D. S. Publishers, Pacific Coast Dentist Publication Co. Price $2.50.

Southern Dental Journal, Macon, Ga. Editor, H. H. Johnson, D. D. S. Publishers, Holmes & Mason. Price $2.00.

Western Dental Journal, Kansas City, Mo., 900 Grand Ave. Editor. J. D. Patterson, D. D. S. Publishers, R. I. Pearson & Co. Price $2.00.

BI-MONTHLY.

Dental Office and Laboratory, Philadelphia, Pa., 620 Race St. Editor, Theodore F. Chupein, D. D. S. Publishers, Johnson & Lund. Price $1.00.

Dental Journal, Ann Arbor, Michigan. Edited by Students. Price $1.00.

Dominion Dental Journal, Toronto, Canada, Post office box 298. Editors, W. Geo. Beers, L. D. S., A. H. Hipple, L. D. S., A. C. Cogswell, D. D. S. Publishers, Dominion Dental Journal Co. Price $1.00

QUARTERLY.

Dental Practitioner and Advertiser, Buffalo, N. Y., 587 Main St. Editor, W. C. Barrett, M. D., D. D. S. Publishers, Buffalo Dental Manufacturing Co. Price $1.00.

Dental Headlight, Nashville, Tenn., 216 N. Summer St. Editors, H. W. Morgan, M. D., D. D. S., Ambrose Morrison, M. D. Publishers, Morrison Brothers. Price 50 cents.

Odontographic Journal, Rochester, N. Y., 117 State St. Editor, J. Edward Linn, D. D. S. Publisher, Geo. P. Davis. Price $1.00.

Pacific Dental Journal, Tacoma, Washington. Editor, W. E. Burkhart. Publishers, Burkhart Dental Supply Co. Price $1.00.

Texas Dental Journal, Dallas, Texas, 719 Elm St. Editor not given. Publisher, A. P. Cary. Price $1.00.

ENGLAND—SEMI-MONTHLY.

British Journal of Dental Science, London, 289 Regent W. Editor not given. Publishers, J. P. Segg & Co. Price 14 shillings.

MONTHLY.

Dental Record, London, 6 to 10 Lexington St. Editor not given, Publishers, The Dental Manufacturing Co. Price 7 shillings.

Journal of the British Dental Association, London, 20 and 21 King William St., Strand. Editor not given. Publishers, Bailliere, Tindal & Cox. Price 7 shillings.

FRANCE—MONTHLY.

L'Odontologie, Paris, 57 rue Rochechouart. Publisher, M. F. Touchard. Price 10 francs.

Le Monde Dentaire, Paris, 37 rue de la Chausse d'Antin. Publisher, Paul Vasseur. Price 3 francs.

L'Avenir Dentaire, Paris, 37 Boulevard de Sebastopol. Editor, Dr. Delaunay. Publisher, F. Menetrrier. Price 5 francs.

Le Progrès Dentaire, France, 22 rue du 4 Septembre. Editor not given. Publishers, C. Ash & Son. Price 10 francs.

Revue Internationale d'Odontologie, Paris, 2 rue d'Amsterdam. Editor, Paul Dubois. Publisher, Paul Dubois. Price 10 francs.

Revue Odontologique, Paris, 3 rue de l'Abbaye. Publishers, L'Association de l'Odontologique. Price 10 francs.

GERMANY—WEEKLY.

Journal fur Zahnheilkunde, Berlin, Chausseestrasse 1 a. Editor, Dr. Erich Richter. Publisher, Erich Richter. Price 8 marks.

Zahnarztliches Wochenblatt, Hamburg, Bei dem Zippelhause 7–9. Editor, Dr. Andreae. Publisher, F. W. Rademacher. Price 8 marks.

MONTHLY.

Deutsche Monatsschrift fur Zahnheilkunde, Leipzig, Konigsstrasse 18. Editor, Jul. Parreidt. Publisher, Arthur Felix. Price 14 marks.

Monatsschrift Des Verrins Deutscher Zahnkunstler, Leipzig, Konigsplatz 17.II. Editor, Arthur Stopler. Price 9 marks.

BI-MONTHLY.

Die Zahntechnische Reform, Berlin, Friedrichshagen. Editor, G. H. Pawelz. Publisher, G. H. Pawelz. Price 7 marks.

QUARTERLY.

Correspondenz-Blatt fur Zahnarzte, Berlin, Berlin, Jager Strasse 88. Publishers, C. Ash & Son. Price 5 marks.

AUSTRIA—BI-MONTHLY.

Odontoskop, Budapest, Gizella-Ter 2. Editor, Iszlai Jozsef. Publisher, I. Jozsef. Price 2 marks.

QUARTERLY.

Oesterreichisch-Ungarische Vierteljahrsschrift fur Zahnheilkunde, Vienna, Goldschmiedgasse nr. 2. Editor, Julius Wiess. Publisher, Julius Wiess. Price 5 marks.

SWITZERLAND—QUARTERLY.

Schweizerische Vierteljahrsschrift fur Zahnheilkunde, Zurich, Bahnhofstrasse 94. Editor, Dr. C. Redard and Dr. Theo. Frick. Publisher, Societe Odontologique Suisse. Price 10 francs.

ITALY—MONTHLY.

Il Progresso Dentistico, Milano, Via Meravigli 2. Editor, Dr. Carlo Platschick. Publisher, Carlo Platschick. Price 10 lira.

La Reforma Dentistica, Napoli, Via Bellina 27. Editor, Prof. G. Cali. Publisher, G. Cali. Price 8 lira.

BI-MONTHLY.

L'Odontologia, Palermo, V. Montevergini 2. Editor, Luigi Ribolla-Nicodemi. Publisher, Luigi Ribolla-Nicodemi. Price 5 lira.

QUARTERLY.

Giornale Di Corrispondenza Pei Dentisti, Milano, Via Tomaso Crossi. Editor, Cav. Dott. Alberto Coulliaux. Publishers, C. Ash & Son.

DENMARK—MONTHLY.

Skandinaviska Tandlakareforeningens Tidskrift Copenhagen, Radhusstraede 1. Editor, Carl Christensen. Publisher Martius Truslsens Bogtrykkeri. Price 4 Kr.

RUSSIA—MONTHLY.

Messager Odontologique, St. Petersburg, Newsky No. 79. Editor, Dr. A. P. Sinitzin. Publisher, A. P. Sinitzin. Price 20 p.

SPAIN—MONTHLY.

LaOdontologia, Cadiz, San Jose No. 2. Editor, Dr. Floreatan, Aguilar. Publisher, F. Aguilar. Price 10 pasetas.

NORWAY—MONTHLY.

Den Norske Tandlaegeforenings Tidende, Christiania. Editor, O. Seel.

CUBA—MONTHLY.

Revista Dental, Havana, Salud 39. Editor, Alberto Colon. Publisher, A. Colon. Price $2.50.

JAPAN.

Dental Journal, Tokio. Publisher, Qusaburo Midsuhoya.

## BOOKS AND PAMPHLETS PERTAINING TO DENTISTRY

PUBLISHED DURING THE YEAR.

BOOKS.

A Practical Treatise on Mechanical Dentistry, by Joseph Richardson, M. D., D. D. S. Revised and edited by G. W. Warren, D. D. S. P. Blakiston, Son & Co., Philadelphia.

A Study of the Degeneracy of the Jaws of the Human Race, by E. S. Talbot, M. D., D. D. S. The S. S. White Dental Manufacturing Co., Philadelphia.

A Compend of Dental Pathology and Dental Medicine, by George W. Warren, D. D. S. P. Blakiston, Son & Co., Philadelphia.

A Series of Questions and Answers for Dental Students, consiting of three parts, by F. J. S. Gorgas, M. D., D. D. S. Snowden & Cowman, Baltimore.

Anæsthetics and Their Administration, by T. W. Hewitt, M. A., D. D. S. Charles Griffin & Co., London.

A Practical Treatise on Artificial Crown and Bridge Work, third edition, revised and enlarged by George Evans. The S. S. White Dental Manufacturing Co., Philadelphia.

Catching's Compendium of Practical Dentistry for 1892. B. H. Catching, D. D. S., Atlanta, Ga.

Clifford's Manual of Recitation in Materia Medica, Pharmacy and Therapeutics, by E. L. Clifford, D. D. S. The Kauffman Medical Publishing Co., Chicago.

Code du Chirurgien Dentisti, by Roger & Gondon, J. B. Bailliere et Fils, Paris.

Dental Metallurgy, by Charles J. Essig, M. D., D. D. S. The S. S. White Dental Manufacturing Co., Philadelphia.

Diseases and Injuries of the Teeth, Indluding Pathology and Treatment, by Morton Smale, M. R. C. S., L. S. A., L. D. S. Longmans, Green & Co., London.

Die Mikroorganismens Der Mundhohle, by Von W. D. Miller, M. D., D. D. S., Berlin.

Descriptive Anatomy of the Human Teeth, by G. V. Black, M. D., D. D. S. Second edition. Wilmington Dental Manufacturing Co., Philadelphia.

Elements of Chemistry and Dental Materia Medica, by J. S. Cassidy, D. D. S., M. D. Robert Clark & Co., Cincinnati.

Formulaire Pratique pour les Maladies de la Bouche et des Dents, by G. Vian, Paris.

Methods of Filling Teeth, by R. Ottolengui, M. D. S. The S. S. White Dental Manufacturing Co., Philadelphia.

Notes on Anæsthetics in Dental Surgery, by Arthur S. Underwood, M. R. C., L. D. S., and C. C. Braine, F. R. C. S. Second edition. Claudius Ash & Sons, London.

Letters to a Mother, from a Mother, on the Formation, Growth and Care of the Teeth, by Mrs. M. W. J. Wilmington Dental Manufacturing Co., Philadelphia.

Orthodontia or Malposition of the Human Teeth, by S. H. Guilford, A. M., D. D. S., Ph. D., Philadelphia.

The Angle System of Regulation and Retention of the Teeth, third edition, by Edward H. Angle, D. D. S. Wilmington Dental Manufacturing Co., Philadelphia.

PAMPHLETS.

A Plain Talk about the Teeth, by G. H. Chance, D. D. S., Portland, Oregon.

Dis Complications, Infectieuses Buccales et Dentaires de La Grippe, by A. C. Hugenschmidt, Paris.

Heredity, by I. P. Wilson, D. D. S., Burlington, Iowa.

Syphilis of the Mouth and the Teeth, by A. C. Hugenschmidt, M. D., D. D. S., Paris.

The Teeth and the Care of Them, by The Georgia State Dental Society.

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### LECTURERS.

WM. F. SMITH, A. B. M. D., Regional Anatomy. J. MEYER, D. D. S., Continuous Gum.
J. N. FARRAR, M. D., D. D. S., Irregularities. DR. GEORGE EVANS, Crown and Bridge Work.
DR. K. C. GIBSON, Artificial Palates and Fractured Maxillaries.

### CLINICAL INSTRUCTORS.

CORYDON PALMER, D. D. S., Ohio.
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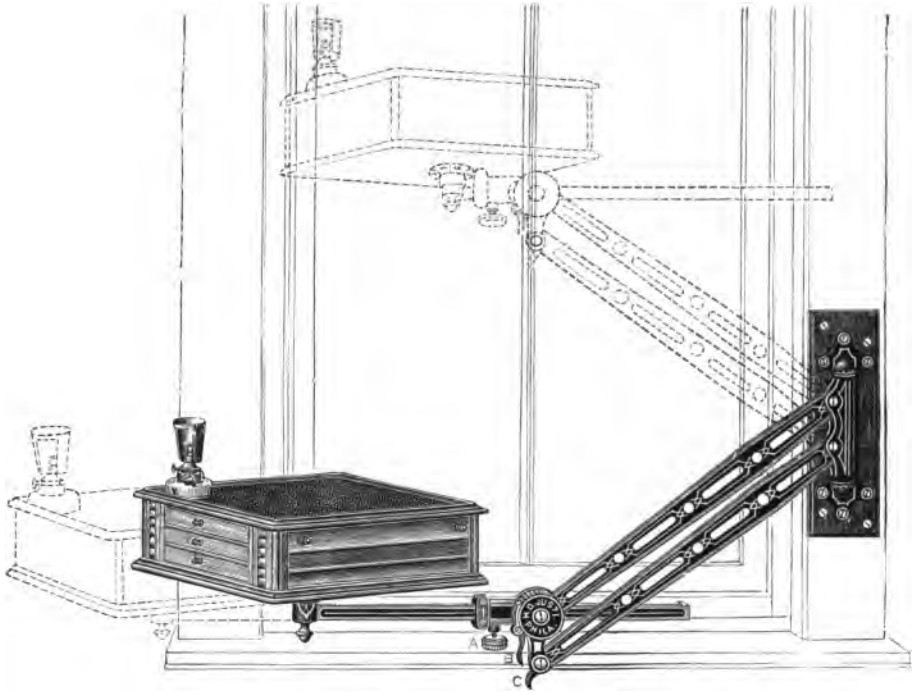

*A*, represents the set screw which secures the sliding bar. *B*, the trigger which controls the ratchet, and *C*, the finger for raising and lowering.

The success which this Bracket has achieved, and the universal popularity and demand for it, has far exceeded our highest expectations; having made a number of improvements since its original introduction, we considered it essential to give a new illustration of it as it is now made, accompanied by the Grigg Table.

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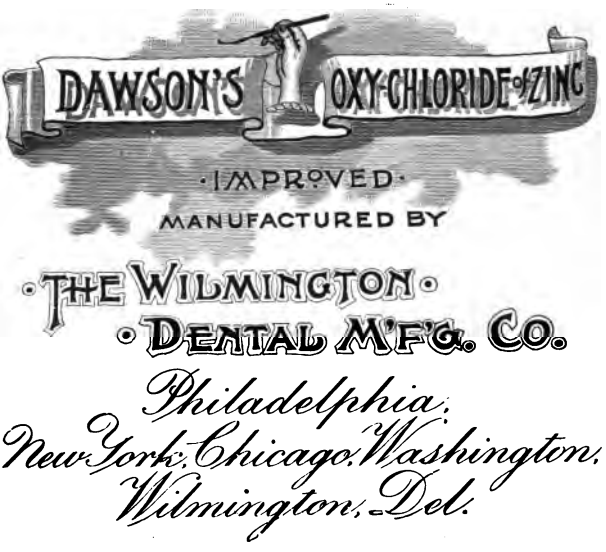


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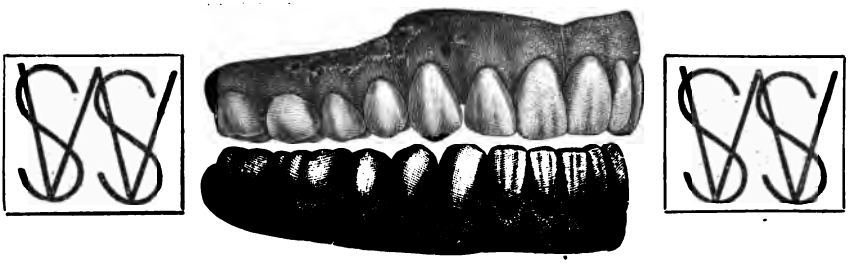

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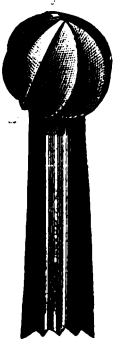

Let us see. Would the dentist, if he were looking for a pocket-knife, buy two poor ones at fifty cents each with the expectation that they would be as useful as one of the highest quality which might cost him a dollar? Not if he was a "shrewd buyer." Now, if shrewd buying, would dictate the purchase of the better knife, why should it not as surely decide in favor of the better burs? Certainly there is more reason for it. The knife is a purely personal purchase, and personal comfort says "get the best." Doesn't "personal comfort" enter as much into the use of excavating burs as into that of the knife? to say nothing of the comfort of the patient.

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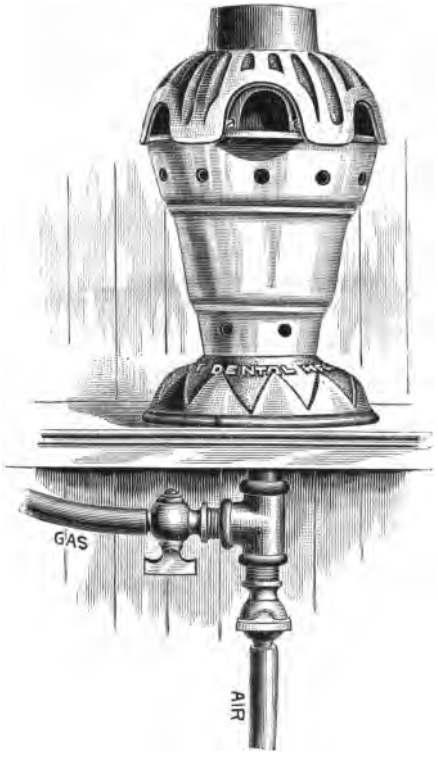


These furnaces are made in three sizes, respectively, for Crown Work, Bridge Work and Continuous Gum Work. The cut shows our Crown Furnace which is intended for baking porcelain inlays, porcelain crowns, small porcelain bridges, mending broken teeth, burning gold fillings on to porcelain teeth, fusing stains on to porcelain teeth to match the natural teeth or imitate any natural defect. The furnaces have a platinum muffle which makes the gasing of work an impossibility.

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CHARLES W. NEEBE, D.D.S., Assistant Demonstrator of Crown and Bridge Work.
EDMUND W. HOLMES, M.D., Demonstrator of Anatomy.
ROBERT FORMAD, V.M.D., Demonstrator of Normal Histology.

### ARRANGEMENT OF THE REGULAR SESSION.

The Collection Year consists of one session, beginning in October and ending early in June. The Session 1894-95 begins on Monday, October 1, 1894, and ends at Commencement, June 4, 1895.

### EXAMINATIONS.

Attendance upon three regular winter courses of lectures will be required before final examination for the degree of Doctor or Dental Surgery. At the close of the first year, examinations are held in Chemistry, Histology and Materia Medica, and the second year upon Anatomy and Physiology. If the student is not qualified, a second examination is afforded him at the beginning of the next winter session.

The final examination at the end of the course is in Operative Dentistry, Mechanical Dentistry, Metallurgy, Dental Pathology and Therapeutics.

All applicants for advanced standing must pass the required examinations of this school, or furnish proof that they have passed equivalent examinations in some recognized Dental or Medical school.

Graduates of a recognized medical college will be admitted to the second-year class without examination.

### CONDITIONS OF ADMISSION.

Candidates for admission are required, first, to write an essay (not exceeding a page of foolscap) as a test of orthography and grammar; second, to pass an examination in the English branches—viz: grammar, arithmetic, history and geography. A candidate who has received a collegiate degree, or passed the matriculate examination of a recognized college, or who has a certificate from a normal, high, or grammar school, or a teacher's certificate, properly attested, may enter without examination.

### FEES.

| | | | |
|---|---|---|---|
| Matriculation Fee (paid once only), - | $ 5 00 | Dissecting Fee (second year), - - - | $10 00 |
| Fee for One Course of Lectures, - - - | 100 00 | Graduation Fee (third year), - - - - | 30 00 |

For information and announcements address—

JAMES TRUMAN, DEAN,
3243 Chestnut Street, Philadelphia, Pa.

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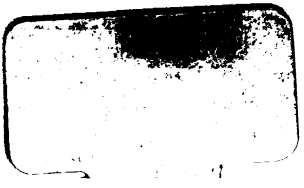

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